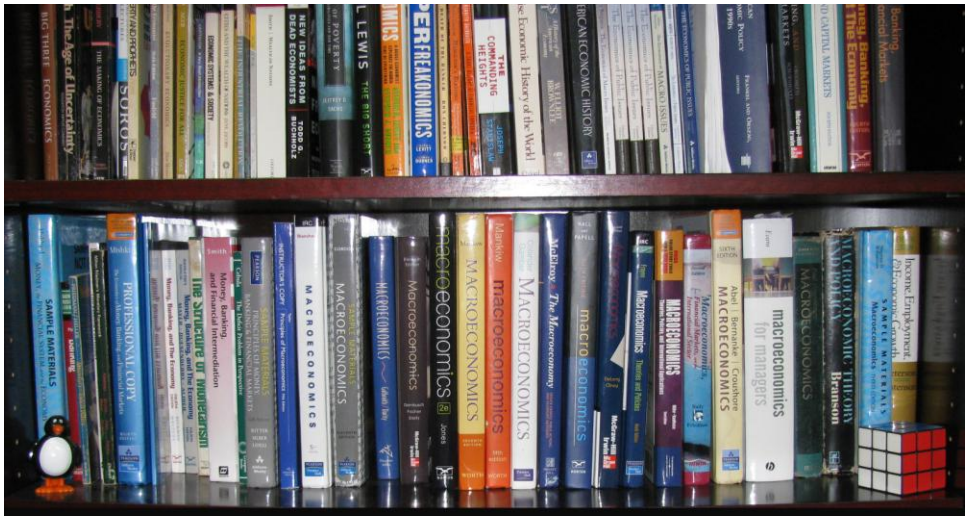

Peer reviewed

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Abstract

This paper analyzes the results of a survey of undergraduate students in upper-level, policy oriented classes regarding their understanding of current economic policy issues. It is found that the percentage of survey questions answered correctly is significantly higher for respondents with formal economic education in the form of a high school economics class or is a college economics major. Students with a higher reported interest in economics and those with a reported Libertarian political philosophy also scored significantly higher. In addition, males scored significantly higher than females on this set of survey questions.

Introduction.

This paper investigates the effect of economic education on undergraduates' knowledge of widely discussed economic issues and commonly implemented economic policies. Results from a survey of 144 college students taking junior and senior level economics, political science, sociology, and social work classes are analyzed. The survey is composed of twenty multiple choice questions. Some questions relate to existing economic policies, such as rent control and minimum wage laws. Others address currently debated issues, such as the conduct of fiscal policy and the promotion of economic growth. The percentage of survey questions correctly answered is used as a measure of economic knowledge. The effects of formal economic education on economic knowledge are estimated while controlling for the political philosophy, degree of economic interest, age, race, and gender of the student.

The current economic and political environment underscores the importance of economic knowledge. Issues such as healthcare reform, financial bailouts, and federal deficit reduction are in the news daily. Gerardi, Goette, and Meier (2010) demonstrate the importance of economic knowledge in the context of recent problems in the financial sector. Their evidence suggests that a lack of financial literacy had a significant effect on financial delinquencies and defaults in 2007-2009.

It is important to establish the effect of economic education on economic knowledge. If economic education indeed significantly increases economic knowledge, then social welfare theory supports both the public provision of economic education and the inclusion of economics courses in the core curriculum of high schools and colleges. This theory is based on the assumption that education provides positive external benefits to society. One such externality is the potential benefit of better informed citizens and voters. Economic education may broaden the social awareness of citizens, as well as improve their ability to comprehend the intricacies of both economic and foreign policy. Better informed voters are expected to exert pressure upon elected representatives to support policy that is consistent with the maximization of overall social welfare. Thus, better educated voters may benefit all of society.

Previous studies support the idea that economic knowledge affects public opinion. Both Walstad (1997) and Blendon, Benson, Brodie, Morin, Altman, Gitterman, Brossard, and James (1997) found that economic knowledge has a significant impact on public opinion regarding economic issues. Public opinion then influences the policy choices of political leaders. The political impact of public opinion regarding economic issues is demonstrated by the focus on the state of the economy by the 1992 Clinton and 2008 Obama presidential campaigns. A 1996 Harris poll, cited by Blendon, et al, further illustrates this point

through its finding that the economy and jobs are the most important issues considered by respondents when voting for president.

Research has found that the public strongly supports economic education. Markow and Bagnoski (2005) examine results of a Harris interactive poll of 3,512 adults and 2,242 students in grades 9-12. More than 90 percent of respondents to the Harris poll thought it was important for people to have a good understanding of economics. In addition, virtually all the adults participating in the poll thought that economics should be included in the high school curriculum. It seems reasonable to assume that public support of economic education is based on belief that it significantly increases economic knowledge.

The question addressed by this study is whether economic education at high school and college levels has a significant positive impact on the economic knowledge of undergraduates. This study is not concerned with knowledge of technical tools of economics, such as elasticities, isoquants, and IS-LM diagrams. Rather, economic knowledge is defined here as an understanding of basic concepts central to current economic policy debates, such as the effects of price controls or the dangers of over-expanding the money supply. Does the completion of a high school economics class still significantly contribute to the economic knowledge of students years later when they are upper-level college students? Are college economics majors better informed about current policy issues than are students in competing policy oriented majors such as political science and sociology? Alternatively, do non-economics majors gain similar knowledge of basic economic issues from class discussions, the news media, and life experiences? These are the issues addressed by this paper.

The Survey.

The survey was administered to students in senior level economics, political science, sociology, and social work classes. It is composed of two sections. The first section contains 20 multiple choice questions relating to commonly discussed economic issues. These questions are provided in the Appendix to this paper. The number of questions was kept relatively small to avoid placing a time burden on the students and their instructors. Also, a larger set of questions could cause respondents to guess at answers simply to complete the survey. Questions in the second section ask for categorical information about the respondent. This information is used to construct the explanatory variables used in the regression analysis described below.

The questions in the first section are worded so that familiarity with technical terms specific to the economics discipline is not required. Rather, the questions attempt to gauge the respondent's knowledge regarding publicly debated economic issues. For example, the first question addresses the potential effects of a price cap on the market for gasoline. The term "price cap" is defined

within the question. Similarly, the term “price floor” is defined within the question addressing effects of agricultural price supports. However, some questions do test for knowledge of basic terms needed to understand economic discussions. For example, one question asks what is measured by “GDP”.

Approximately half of the survey questions address knowledge of various microeconomic issues. Examples include the potential effects of price caps on the availability of gasoline, rent control on the market for housing, minimum wage laws on the unemployment rate, and government mandated employee benefits (such as family leave) on employment. Other questions examine understanding of the functioning of the price system. For example, respondents are asked how a free market responds to a shortage of a product. The remaining questions address macroeconomic issues, such as the role of the Federal Reserve and the conduct of fiscal policy. One question checks for familiarity with recent macroeconomic events by asking if the respondent knows the name of the current Chairman of the Federal Reserve System. Two questions address factors leading to long term economic growth.

Variables Created from the Survey Responses.

The percentage of questions answered correctly in the first part of the survey is used as the measure of economic knowledge of each student. This variable is denoted as "PctScore" in all following tables and discussion. The other variables, created from information gathered in the second section of the survey, capture various characteristics of the respondent and are intended to explain the PctScore of students. With the exception of student age, the explanatory variables are qualitative or categorical in nature. The number of students falling into each category is shown below in Table 1.

Table 1
Observations of each Data Category

Category	Sample #		Category	Sample #
HSEcon	86		Liber	8
Econ	29		DemLib	37
1or2BC	28		RepCons	28
MoreBC	18		ModInd	20
MedInt	64		Female	79
HighInt	45		NonCaucasian	19

Dummy variables are used to indicate the student's exposure to economic education. The first of these, denoted as "HSEcon", takes a value of one if the student completed a high school economics course and a value of zero otherwise. A second variable, denoted "Econ", has a value of one if the student is a college economics major and a value of zero otherwise. Because the data was collected in junior and senior level classes, all students in the Econ category had taken a full year of Principles of Economics and were taking upper level economics classes at the time of the survey.

Another set of variables measures the student's exposure to business courses in college. Business courses include some aspects of economics. This group was separated into two categories. The first, denoted as "1or2BC", includes students who have taken either one or two business courses. Principles of economics courses are the most popular choice of business classes among non-business majors at this institution, and students are not allowed to take junior or senior level business classes until they have completed both principles of economics classes with a minimum grade of C. Therefore, most students in this group have successfully completed either one or two semesters of economics principles. The second variable, denoted "MoreBC", indicates that a student has taken more than two business classes. This usually indicates that they had taken both principles of economics as well as offerings in accounting, finance, marketing, or management.The control for these two groups is the set of students having taken no business classes.

A respondent's degree of interest in economics is captured by another set of indicators. The first of these is MedInt, which takes on a value of one if the student expresses a medium level of interest (zero otherwise). The second is HighInt, which is set equal to one if the student claims a high level of interest. The overall control for these two variables is a low level of interest in economics. These variables are intended to indicate whether students are likely to pursue an interest in economic issues by seeking knowledge from books, articles, newscasts, and other sources outside the classroom.

A student's professed political philosophy is accounted for by the following set of variables. These dummy variables include "DemLib" for Democrats or liberals, "RepCons" for Republican or conservatives, "IndMod" for Independents or moderates, and "Liber" for Libertarians. The overall control for this set of political dummy variables is the set of respondents declaring no political philosophy or affiliation.

Additional explanatory variables are used to control for demographic characteristics of the respondents. The first of these is a dummy variable (Gender) which is set equal to one for female students (zero for males). A second variable (Race) is zero for white students and one for all other students. Student age (in years) is the only explanatory variable that is not a dummy. The age variable is used to investigate whether the level of economic knowledge changes with maturity. This variable also may capture any significant difference in economic knowledge of traditional versus non-traditional students [1].

The Initial Regression Model.

This study uses linear regression to analyze the effects of economic education on economic knowledge. The dependent variable of this regression is "PctScore". The other variables created from the survey responses are used as explanatory variables in this regression. An initial regression model that includes the complete set of explanatory variables is given by:

$$\begin{aligned} PctScore = {} & \beta_0 + \beta_1 HSEcon + \beta_2 Econ + \beta_3 1or2BC + \beta_4 MoreBC + \beta_5 MedInt \\ & + \beta_6 HighInt + \beta_7 Liber + \beta_8 DemLib + \beta_9 RepCons + \beta_{10} IndMod \\ & + \beta_{11} Gender + \beta_{12} Race + \beta_{13} Age + \varepsilon. \end{aligned}$$

Each beta (β) coefficient measures the effect on PctScore of a one unit change in the associated variable holding all other explanatory variables constant. For the dummy variables, the beta coefficient measures the average difference in PctScore between students in the group of interest (assigned a value of one) and those in the control group. For example, the β_1 coefficient shows the average difference in PctScore of economics majors versus non-economics majors controlling for the effects of the other explanatory variables. The component of PctScore that is not explained by the model is captured by the error term ε.

Ordinary least squares (OLS) estimates of the regression model are displayed in Table 2 below. There are 144 observations in the data set. Each observation corresponds to an individual student's set of survey responses. The R-square statistic shows that this regression model explains 47.6 percent of variation in PctScore. The small value of the Prob(Fstatistic) indicates that the R-square statistically is significantly different from zero [2]. The adjusted R-square is equal to 0.423891, and the standard error of the regression is equal to 14.88 [3].

Table 2
Initial Model Estimates

Dependent Variable: PctScore
Method: Least Squares
Included observations: 144

Variable	Coefficient	Std. Error	t-Statistic	p-value
C	39.52928	6.116959	6.462244	0.0000
HSEcon	5.312113	2.752103	1.930201	0.0558
Econ	20.85024	3.731712	5.587313	0.0000
1or2BC	7.118187	3.434420	2.072602	0.0402
MoreBC	6.247878	4.011043	1.557669	0.1217
MedInt	5.831741	3.376155	1.727332	0.0865
HighInt	8.820183	4.228986	2.085650	0.0390
Liber	18.12759	6.168940	2.938527	0.0039
DemLib	3.244592	3.396046	0.955403	0.3411
RepCons	2.327210	3.594099	0.647509	0.5184
IndMod	3.076141	4.163101	0.738906	0.4613
Gender	-6.059235	2.891936	-2.095217	0.0381
Race	-0.838942	3.976152	-0.210993	0.8332
Age	-0.035242	0.172012	-0.204883	0.8380

R-squared	0.476265	Adjusted R-squared	0.42389
F-statistic	9.093623	Prob(F-statistic)	0.00000
S.E. of regression	14.88043		

Before proceeding further, it is important to check the basic assumptions of the regression model. The model assumes that the error terms (ε's) are normally distributed and have a constant variance (homoskedasticity). If either of these assumptions is violated, t-statistics and F-statistics calculated for the model estimates may follow non-standard statistical distributions. This may cause the researcher to draw incorrect conclusions regarding the statistical significance of

the explanatory variables. The assumptions are tested using the residuals, or sample errors, from the estimated regression model.

A Jarque-Bera test fails to reject a null hypothesis that the residuals are normally distributed. A Breusch-Pagan-Godfrey test then is used to check the assumption that the residuals have a constant variance. This test runs a regression of the squared residuals series on the complete set of explanatory variables. A statistically significant R-square from this regression indicates that the residuals do not have a constant variance (are heteroskedastic). The test fails to reject the null hypothesis of homoskedastic residuals for this regression. Thus, it appears that the assumption of homoscedastic, normally distributed residuals is reasonable [4].

The explanatory variables together with their estimated beta coefficients are displayed in the first two columns of Table 2 above. The t-statistic and p-value for each coefficient are provided in the fourth and fifth columns. The t-statistic for each coefficient is calculated as the value of the coefficient estimate divided by its standard error (provided in the third column). The p-value, or marginal significance level, of this t-statistic then determines whether the variable has a statistically significant effect on economic knowledge. A smaller p-value provides stronger evidence against a null hypothesis that the given explanatory variable has no effect on PctScore. The null hypothesis of no effect can be rejected if the p-value is less than a standard test size [5].

The variables DemLib, RepCons, IndMod, Race, and Age are not statistically significant even using a 15 pecent test size. MoreBC is marginally significant at only a 12.2 percent level, and MedInt is marginally significant at an 8.65 percent level. The marginal significance level of the HSEcon variable is 5.58 percent. All other explanatory variables are statistically significant using a 5 percent test size. The positive estimated coefficients multiplying the variables Econ, HSEcon, and 1or2BC indicate that economic education has a significant direct effect on PctScore after controlling for effects of the other explanatory variables included in this model.

The Final Regression Model.

A general-to-simple modeling strategy is next employed to eliminate insignificant explanatory variables from the model. Beginning with the initial model estimates described in the previous section, the explanatory variable with the least significant (highest p-value) coefficient is deleted. The model then is re-estimated. This procedure is repeated until only variables with a marginal significance level less than 15 percent remain [6]. Final estimates are displayed in Table 3. The deleted variables are DemLib, RepCons, IndMod, Race, and Age. Deleting these variables results in a numerically small and statistically insignificant drop (from 47.6 percent to 47.1 percent) in R-square [7]. However, both the slight increase in adjusted R-square (from 42.39 percent to 43.97

percent) and the small decline in the standard error of the regression (from 14.88 to 14.67) suggest that deletion of the insignificant variables improves the model [8].

Table 3
Final Model Estimates

Dependent Variable: PctScore
Method: Least Squares
Included observations: 144

Variable	Coefficient	Std. Error	t-Statistic	p-value
C	39.25676	3.789694	10.35882	0.0000
HSEcon	5.924949	2.560215	2.314239	0.0222
Econ	21.01714	3.546646	5.925919	0.0000
1or2BC	7.611055	3.310161	2.299301	0.0230
MoreBC	5.767236	3.875622	1.488080	0.1391
MedInt	6.651846	3.228186	2.060553	0.0413
HighInt	9.217410	3.894110	2.367013	0.0194
Liber	16.79638	5.714806	2.939099	0.0039
Gender	-5.810726	2.796197	-2.078082	0.0396

R-squared	0.471115	Adjusted R-squared	0.43977
F-statistic	15.03177	Prob(F-statistic)	0.00000
S.E. of regression	14.67388		

The final model is given by:

$$PctScore = \beta_0 + \beta_1 HSEcon + \beta_2 Econ + \beta_3 1or2BC + \beta_4 MoreBC + \beta_5 MedInt + \beta_6 HighInt + \beta_7 Liber + \beta_8 Gender + \varepsilon.$$

This model explains 47.1 percent of variation in PctScore. The Jarque-Bera test fails to reject the null hypothesis of normality, while the Breusch-Pagan-Godfrey test fails to reject the homoskedasticity of the residuals.

Collinearity, or a strong linear relationship between the explanatory variables, is a potential problem that may affect the precision of the coefficient estimates. If strong collinearity is present, then it is difficult to isolate the effect of a given explanatory variable from the effects of other variables. One check for collinearity is to examine the size of the correlations between the explanatory variables. The correlations are presented in Table 4 below. Correlations tend to be small, indicating that collinearity is not a major problem for this regression

model. The highest correlation (0.408) is between the economics major (Econ) and high interest in economics (HighInt) dummies.

Table 4
Correlations between the Explanatory Variables

	HSEc	Econ	1-2BC	MreBC	MedInt	HiInt	Liber	Gender
HSEc	1.000	0.129	-0.133	-0.032	0.079	-0.026	0.013	0.051
Econ	0.129	1.000	-0.246	0.176	-0.135	0.408	0.104	-0.310
1-2BC	-0.133	-0.246	1.000	-0.185	-0.086	-0.141	-0.119	0.163
MreBC	-0.032	0.176	-0.185	1.000	0.084	0.062	0.091	-0.205
MedInt	0.079	-0.135	-0.086	0.084	1.000	-0.603	-0.155	0.081
HighInt	-0.026	0.408	-0.141	0.062	-0.603	1.000	0.294	-0.351
Liber	0.013	0.104	-0.119	0.091	-0.155	0.294	1.000	-0.267
Gender	0.051	-0.310	0.163	-0.205	0.081	-0.351	-0.267	1.000

Each estimated coefficient provides a measure of the effect of the given explanatory variable on PctScore after controlling for the effects of the other explanatory variables. HSEcon increases PctScore by 5.92 points with a 2.2 percent marginal significance level. Having taken a high school economics class appears to have a significantly positive effect on economic knowledge for this group of college students. Being an economics major increases PctScore by 21.02 points with a 0.0 percent marginal significance level. This result indicates that the students in this sample gained a statistically significant and quantitatively large amount of knowledge concerning economic issues from being an undergraduate economics major. The economics major appears to provide knowledge to students not gained from other courses, media sources, or life experiences.

These findings are consistent with those from previous research. Markow and Bagnoski found in a Harris interactive poll of 3,512 adults and 2,242 students in grades 9-12 that those who had economics in high school were more likely to get a passing grade on the survey questions involving economics. Walstad examined results of a Gallup poll consisting of 15 economic questions. Using regression analysis it was found that economic knowledge as measured by poll score was significantly higher for those who had taken an economics course. Walstad and Allgood (1999) examined scores of college seniors on a similar Gallup poll. Those having an economics course scored significantly higher (62 percent correct versus 48 percent).

Taking one or two business classes increases PctScore by 7.61 points and has a 2.3 percent marginal significance level. Taking more than two business classes increases PctScore by 5.77 points with a marginal significance

level of 13.9 percent. A likelihood ratio test reveals that the two coefficients do not significantly differ [9]. Thus, it appears that additional business classes beyond the first two taken by a student do not significantly increase PctScore. Because the initial business courses taken by most students are the two semesters of principles of economics, these results tend to indicate that taking principles of economics contributes significantly to economic knowledge.

A student's professed level of interest in economics also has a significant effect on economic knowledge. Having a medium interest increases PctScore by 6.65 points (4.1 percent marginal significance level), and having a high degree of interest in economics increases PctScore by 9.22 points (1.9 percent marginal significance level). This is consistent with Markow and Bagnoski, who found that those with a high interest in economics are more likely to score an A on the economics questions in a Harris poll. It seems reasonable to assume that interested students seek additional economic information from sources outside the classroom. If this assumption is correct, then the regression results indicate that interested students gain significant economic knowledge from non-classroom sources such as the print and broadcast media.

Results for the political dummy variables are analyzed next. Controlling for the influence of the other explanatory variables, students in this sample claiming to be Democratic-liberal, Republican-conservative, and Independent-moderate do not score significantly higher on the survey questions than students expressing no political interest at all. However, students claiming a Libertarian political philosophy score 16.79 points (0.4 percent marginal significance level) higher. It appears that within this sample, even after accounting for economic education and expressed level of economic interest, the Libertarian students are significantly more knowledgeable about economic issues than students in any other political group. This conflicts with the finding of Blinder and Krueger (2004) that economic knowledge was lower for those describing themselves as "not political" than for self-professed liberals, conservatives, or moderates. This also contrasts with the result presented by Walstad that economic knowledge,as measured by a Gallup poll score, was significantly higher for Republicans than either Democrats or Independents.

The estimated coefficient on the Gender dummy variable is significantly negative (3.96 percent marginal significance level). This indicates that within this sample, after accounting for economic education, economic interest, and political orientation, women on average score 5.81 points lower than men on the survey exam. Why women score significantly lower is beyond the scope of this paper; however, we note that this result is consistent with the findings of previous research. Walstad , Walstad and Allgood, Blinder and Krueger, and Markow and Bagnoski found that economic knowledge was higher for males than for females.

Conclusion.

This study has investigated the effect of economic education on the economic knowledge of undergraduates in upper level, policy oriented classes. Economic knowledge is measured as the percentage of correct answers on a set of survey questions concerning economic issues. Regression analysis of the survey results indicates that economic knowledge is significantly higher for students with economic education in the form of a past high school course or a college economics major. After controlling for several other factors, it was found that taking a high school economics class improves respondents' percentage score by almost 6 points. An undergraduate economics major increases percentage score by approximately 21 points.

These results suggest that society benefits from expenditures on economic education by gaining better informed citizens. Thus, it appears that high schools should list economics among their course offerings and perhaps even include the course in their core curriculum. It also suggests that economics should be included in the required general education curriculum of colleges and universities.

Analysis also indicates that students with medium to high expressed interest in economics scored significantly higher on the survey. This suggests that these students are obtaining economic knowledge from their non-economics courses, from media sources, and from life experience. Males scored significantly higher on the survey than females; however, neither race nor age significantly affected scores. There was no significant difference in scores of students identifying themselves as Democrats, Republicans, or Independents. However, professed Libertarians scored significantly higher than students in any other category of political allegiance.

While this study indicates that economics courses do significantly add to the economic knowledge of students, there remain several avenues for further research in this area. First, the survey should be modified to better indicate whether students have taken principles of economics courses versus other business classes. Secondly, the survey should be modified to indicate the majors of all respondents. It is potentially interesting to compare the economic knowledge of students majoring in political science, sociology, and other disciplines. Finally, the survey can be given to a broader group of students including those attending other universities.

Appendix
The Survey Questions

1. Suppose that the current price of gasoline is $2.80 per gallon. If government were to impose a price cap (maximum legal price) of $1.50 per gallon, there would be:

A. more gasoline available to consumers
B. less gasoline available to consumers*
C. no change in availability of gasoline

2. Government has placed price supports (guaranteed minimum prices to producers) on many agricultural markets. These price supports tend to:

A. encourage over-production and result in a surplus of agricultural products*
B. reduce the price of agricultural products to consumers
C. cause a shortage of agricultural products
D. both A and B

3. Suppose that government imposes a tax of $1.00 per unit sold on producers/sellers of a product. Producers will pass what part of this tax on to consumers in the form of a higher price of the product?

A. all of the tax
B. part of the tax*
C. none of the tax
D. depends on the producer

4. Which of the following will eliminate a shortage of a product?

A. government rationing of the product
B. first-come first-served rationing of the product
C. a tax on excess profits made by producers of the product
D. an increase in the price of the product*
E. all of the above

5. An effective minimum wage tends to result in:

A. a lower unemployment rate among unskilled workers
B. a higher unemployment rate among unskilled workers*
C. no change in the unemployment rate among unskilled workers

6. Common resources are jointly owned by everyone in the community and controlled by no single individual. With no government intervention, common resources such as parks, beaches, fish, and wildlife:

A. will be optimally provided and optimally consumed
B. will be under-used or under-consumed
C. will be over-used or over-consumed*

7. In a free market, an increase in demand for a product will result in:

A. a shortage of the product

B. a surplus of the product
C. a decrease in the price of the product
D. an increase in the price of the product*

8. If government regulations force firms to provide greater benefits to workers, such as family leave or increased pension contributions, this will cause:
A. reductions in employment by these firms
B. higher prices of final goods/services produced by these firms
C. both A and B*
D. no change in employment or in the prices of final products produced by the firms

9. If a city sets a maximum amount that can be charged for rent, which is most likely to happen….
A. More apartments will be available than people will want to rent
B. Fewer apartments will be available than people will want to rent*
C. The number of apartment will be equal to the number that people will want to rent

10. What causes inflation?
A. Market slowdowns (recessions)
B. Banks making bad loans
C. Overexpansion of the supply of money*
D. Higher income taxes

11. Which of the following tends to result in greater long term economic growth?
A. more government spending
B. higher income taxes on the wealthy
C. government regulation of financial markets
D. lower tax rates on income earned from savings and investment*

12. Who is the Chairman of the Federal Reserve?
A. Timothy Geitner
B. Alan Greenspan
C. Ben Bernanke*
D. Harry Reid

13. What is the role of the Federal Reserve?
A. Formulates fiscal policy and the tax code.
B. Sets monetary policy and acts as a lender of last resort to banks*
C. Is a private bank with no formal connection to the federal government.
D. Is a branch of Department of the Treasury that acts as watchdog on banking.

14. If Banks decrease the interest rates they charge, then businesses are likely to.

A. Increase their investment spending on new plant and equipment*
B. Increase the prices of the goods they produce
C. Decrease the number or employs they hire

15. Of the following, which group is most likely to be helped by inflation?
A. People who borrowed money at a fixed rate of interest*
B. People living on fixed incomes
C. Banks that loaned money at a fixed rate of interest

16. What does GDP measure?
A. The value of all private wealth within a country
B. The value of all goods and services produced in a country in a given year*
C. The value of all good and services produced in a country but sold abroad in a year
D. The value of all tangible goods produced in a country (intangibles such as services are not included)

17. Which group controls (has final approval of) the fiscal policy (government spending and tax policy) of the United States?
A. Congress*
B. The President of the United States
C. Federal Reserve
D. The Treasury

18.Does setting quotas on imports increase the amount of jobs in America in the long run?
A. Yes
B. No*

19. Changes in which of the following are most widely used as the measure of inflation?
A. Consumer Price Index*
B. Index of leading economic indicators
C. Prime Rate
D. Federal Funds Rate

20. Of the following which is most likely to improve the wages of workers?
A. Increase in stock market prices
B. Increase in business inventories
C. Increases in worker productivity*
D. Increase in interest rates

Endnotes

[1] Student age ranged from 19 to 71 years. Estimates for a model with age specified as a dummy variable with various cutoffs for traditional versus non-traditional students also were obtained, but the dummy variable never was statistically significant..

[2] Prob(Fstatistic) is the p-value of the R-square statistic in a test of the hypothesis that the R-square is equal to zero

[3] Adjusted R-squared penalizes the R-square statistic when additional explanatory variables are added to the regression. The standard error of the regression is an estimate of the standard deviation of the regression errors (ε's). A smaller standard error of the regression indicates a better "fit" of the regression model to the data.

[4] The marginal significance levels of the test statistics are 48.5% for the heteroskedasticity test and 18.0% for the Jarque-Bera test.

[5] "Test size" is the maximum acceptable probability that a valid null hypothesis would be incorrectly rejected.

[6] None of the deleted explanatory variables are statistically significant using a 15% test size if added back individually to the final model shown in Table 3.

[7] Results of a likelihood ratio test indicate that the decline in R-square is not statistically significant. The marginal significance level of the test statistic is 93.6%. This implies that the explanatory variables dropped from the model are not jointly significant.

[8] Adjusted R-square increases because the very small decline in R-square is more than offset by the decrease in number of explanatory variables. Similarly, the decline in the standard error of the regression is due to the decrease in number of explanatory variables.

[9] The likelihood ratio test fails to reject the null hypothesis that the two coefficients are equal with a marginal significance level of 70%.

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