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JOURNAL OF ECONOMICS AND ECONOMIC EDUCATION RESEARCH

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LETTER FROM THE EDITOR

We are extremely pleased to present the issue two of the second edition of the Journal of Economics and Economic Education Research, an official publication of the Allied Academies' Academy of Economics and Economic Education Research, dedicated to the study, research and dissemination of information pertinent to the improvement of methodologies and effective teaching in the discipline of economics with a special emphasis on the process of economic education. The editorial board is composed primarily of directors of councils and centers for economic education affiliated with the National Council on Economic Education. This journal attempts to bridge the gap between the theoretical discipline of economics and the applied excellence relative to the teaching arts.

The Editorial Board considers two types of manuscripts for publication. First is empirical research related to the discipline of economics. The other is research oriented toward effective teaching methods and technologies in economics designed for grades kindergarten through twelve. These manuscripts are blind reviewed by the Editorial Board members with only the top programs in each category selected for publication, with an acceptance rate of less than 25%.

We are inviting papers for the third edition of the Journal for Economics and Economic Education Research and encourage you to submit your papers according to the guidelines found on the Allied Academies webpage at www.alliedacademies.org.

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ECONOMICS EDUCATION ARTICLES

DO HIGH SCHOOL ECONOMICS COURSES MATTER?

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ABSTRACT

Over the past two decades several empirical studies have been published which sought to measure the impact of a high school economics course on student performance in college economics courses. The results of these studies have produced mixed results, with conclusions ranging from positive to negative correlations.

This paper uses the 1993 Test for Understanding College Economics (TUCE) database to address the impact of high school economics on student learning in the principles of economics courses at the college level. The paper begins with a review of the previous literature, and the rationales for the conclusions drawn. Then, some preliminary findings are presented which gauge the impact of high school economics courses on student knowledge, as demonstrated on both the pretest and the posttest in the TUCE database.

INTRODUCTION

Literally, millions of dollars are spent in both the private and public sector to teach high school students the basics of economic principles. Many states have mandated these courses. Organizations such as the National Council on Economic Education, as well as major publishing companies, have invested huge sums of money in curriculum materials and programs for the improvement of economic education. Are we, as a society, getting our money's worth? Most studies show that there are no lasting effects of this educational endeavor, though some have suggested otherwise.

PREVIOUS FINDINGS

Over the past several decades, researchers in economic education have sought to ascertain the value of high school economics courses with respect to students' understanding of economics. A plethora of studies, utilizing a variety of techniques, have produced decidedly mixed results.

In a wide ranging article, Saunders (1970) found that college students that had taken high school economics scored significantly higher on the Test of Economic Understanding (which was used as part of the final examination) than did students without a course in high school economics. However, they did not receive significantly higher grades in the college course.

Studies by Moyer and Paden (1968) and Rothman and Scott (1973) both found that students with high school economics scored higher on pretests, but these differences vanished at the completion of the college course. Conversely, an article by Palmer, Carliner, and Romer (1979) found that, when other factors were controlled, high school economics students did not score any higher on pretests. Further, the students with high school economics achieved lower course grades than did those who had not taken any economics in high school. A study by Reid (1983) agreed with this finding and also concluded that high school economics courses were negatively correlated with grades in university level courses.

During the 1990s, a study by Becker, Greene, and Rosen (1990) indicated that students with high school courses in economics entered their first course in college with a greater understanding of economics, but this advantage had disappeared by the completion of the course. On the other hand, Myatt and Waddell (1990) found that high school courses had a positive and significant impact through the principles level and did not dissipate until the intermediate level.

Two more recent studies found that high school economics courses do make a difference in student achievement. The first, by Brasfield, Harrison, and McCoy (1993) suggested:

> Having had high school economics was positively and significantly related to students' grades in introductory macroeconomics and introductory microeconomics. Rates at which students fail both classes may be reduced by as much as 33 percent if all students take economics in high school . . (p.109).

Similarly, Lopus (1997), using the TUCE database, discovered that students taking a high school class in micro or macro entered the principles course with more knowledge than those with no high school economics background.

With the exception of the Lopus paper, all previous studies involved the "one school, one time" approach to economic education research. Problems with this approach are well documented and are summarized in Siegfried and Fels (1979).

FURTHER EXTENSIONS USING THE TUCE

Based on a more thorough analysis than space here allows, it is apparent that little evidence, prior to Lopus, exits that demonstrates any lasting effects of the high school economics course. Using the TUCE database, a further examination of the lasting effects of high school economics is presented in this section.

TABLE 1
Description and Mean Values of Variables

Variable	Description
Dependent Variables	
PRE	Score Pre-test on 30 micro questions comprising third edition of TUCE
POST	Score Post-test on 30 micro questions comprising third edition of TUCE
Independent Variables	
SAT	Combined score on verbal and math sections of SAT, for students for whom both scores were available
PRIORSEM	Number of semesters completed before current term
SEX	A 0,1 binary variable with 1 indicating a male student
HSECON	A 0,1 binary variable with 1 indicating that student had a high school economics class
CURUNITS	Number hours of college course work undertaken during current term (in quarter units)
TUCECTGR	A 0,1 binary variable with 1 indicating that TUCE score affected student's grade in course (instructor reported)
HRSSTUD	Total hours per week spent studying
HRSWORK	Number of hours a week spent working at a job
HSMICRO	A 0,1 binary variable with 1 indicating student had a high school economics class (at least one semester) that covered micro

Table 1 defines the variables that are used in the various estimations that follow. Table 2 shows the results of univariate Analysis of Variance (ANOVA) to test for between subject effects of high school economics (HSECON) and a high

school microeconomics course (HSMICRO) with the TUCE pretest results (PRE) on the 30 question micro component. For HSECON the test statistic F yields a significance level of .063, which is not enough to conclude any significant difference (at the .05 percent level) between the students who took a course in high school economics and those who did not.

Table 2
Univariate Analysis of Variance Tests of Between-Subjects Effects
Dependent Variable: PRE

Source	Type III SS	df	Mean Square	F	Sig.
Corrected Model	54.550[a]	1	54.550	3.459	0.063
Intercept	294164.437	1	294164.437	18652.472	0.000
HSECON	54.550	1	54.550	3.459	0.063
Error	39884.357	2529	15.771		
Total	337258.000	2531			
Corrected Total	39938.907	2530			

[a] R squared = .001 (Adjusted R Squared = .001)

Table 2 (cont.)
Univariate Analysis of Variance Tests of Between-Subjects Effects
Dependent Variable: PRE

Source	Type III SS	df	Mean Square	F	Sig.
Corrected Model	602.401[a]	1	602.401	39.778	0.000
Intercept	151614.175	1	151614.175	10011.45	0.000
HSMICRO	602.401	1	602.401	39.778	0.000
Error	46189.429	3050	15.144		
Total	398350.000	3052			
Corrected Total	46791.830	3051			

[a] R squared = .013 (Adjusted R Squared = .013)

Conversely, students that took a microeconomics course in high school scored significantly better on the pretest than students that did not take such a course.

However, when the dependent variable is the post test score (POST), both HSECON and HSMICRO show significant effects at the 5 percent level (Table 3).

Table 3
Univariate Analysis of Variance Between-Subjects Effects
Dependent Variable: POST

Source	Type III SS	df	Mean Square	F	Sig.
Corrected Model	254.376[a]	1	254.376	7.815	0.005
Intercept	609501.763	1	609501.763	18726.114	0.000
HSECON	254.376	1	254.376	7.815	0.005
Error	82314.461	2529	32.548		
Total	697621.000	2531			
Corrected Total	82568.837	2530			

[a] R squared = .003 (Adjusted R Squared = .003)

Table 3 (cont.)
Univariate Analysis of Variance Between-Subjects Effects
Dependent Variable: POST

Source	Type III SS	df	Mean Square	F	Sig.
Corrected Model	1605.857[a]	1	1605.857	50.357	0.000
Intercept	316205.616	1	316205.616	9915.624	0.000
HSMICRO	1605.857	1	1605.857	50.357	0.000
Error	97263.381	3050	31.890		
Total	822195.000	3052			
Corrected Total	98869.238	3051			

[a] R squared = .016 (Adjusted R Squared = .016)

Based on prior studies, an explanatory equation was developed to model the results of the pretest, including the variable HSMICRO (Table 4). Here we can see

that student sex and SAT score dominate the relationship in such a way that makes the HSMICRO variable insignificant at the 5 percent level.

Table 4
Regression: ANOVA[b]

	Sum of Squares	df	Mean Square	F	Sig.
Regression	6318.573	4	1579.643	127.223	0.000a
Residual	11584.396	933	12.416		
Total	17902.969	937			

[a.] Predictors: (Constant), SEX, PRIORSEM, SAT, HSMICRO

[b]. Dependent Variable: PRE

TABLE 4 (cont.)
Regression Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	Sig.
(Constant)	-0.688000	0.738		-0.931	0.352
SAT	0.012380	0.001	0.569	21.328	0.000
PRIORSEM	0.005063	0.003	0.038	1.445	0.149
HSMICRO	0.513000	0.295	0.046	1.738	0.083
SEX	-0.744000	0.238	-0.083	-3.134	0.002

[a] Dependent Variable: PRE

When the score on the posttest is used as the dependent variable, and other variables are added into the mix, we find that both HSECON (Table 5) and HSMICRO (Table 6) remain significant at the 5 percent level as explanatory variables.

Table 5
Regression: ANOVA[b]

	Sum of Squares	df	Mean Square	F	Sig.
Regression	6115.332	8	764.416	43.528	0.000[a]
Residual	5742.656	327	17.562		
Total	11857.988	335			

[a]. Predictors: (Constant),HRSWORK, HRSSTUD, PRIORSEM, SEX, HSECON, TUCECTGR, CURUNITS, SAT
[b]. Dependent Variable: POST

CONCLUDING COMMENTS

These preliminary findings indicate that, while economics courses (either general or micro) do not seem to have any lasting effects with regards to the TUCE microeconomics pretest, they do seem to show importance with respect to the results on the posttest. This could suggest that the learning curve is shortened by previous exposure to economics. If this is the case, then high school economics courses would appear to matter.

Further research will be conducted to see if this finding holds with regards to the macroeconomic TUCE and high school courses in macroeconomics. Other variations will include alternative specifications for the independent variables representing the high school economic experience and interpretation of the regression coefficients to gauge their magnitude.

Table 6
Regression: ANOVA[b]

	Sum of Squares	df	Mean Square	F	Sig
Regression	6127.952	8	765.994	43.456	0.000a
Residual	5834.460	331	17.627		
Total	11962.412	339			

[a]. Predictors:(Constant), HSMICRO, HRSSTUD, SEX, TUCECTGR, CURUNITS, PRIORSEM, SAT, HRSWORK
[b]. Dependent Variable: POST

Table 6 (cont.)
Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-4.263000	2.011		-2.12	0.035
SAT	0.019760	0.001	0.656	15.842	0.000
PRIORSEM	-0.004765	0.009	-0.022	-0.539	0.590
SEX	-0.758000	0.486	-0.064	-1.559	0.120
CURUNITS	0.033160	0.059	0.023	0.558	0.577
TUCECTGR	1.508000	0.558	0.108	2.703	0.007
HRSSTUD	0.085500	0.067	0.05	1.279	0.202
HRSWORK	-0.001777	0.025	-0.003	-0.072	0.943
HSMICRO	1.514000	0.636	0.093	2.382	0.018

[a]. Dependent Variable: POST

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DETERMINANTS OF PRINCIPLES OF MACROECONOMICS HOMEWORK PERFORMANCE

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ABSTRACT

We examine the determinants of satisfactory homework performance among Principles of Macroeconomics students. Using OLS and LOGIT regressions, we find that a student's GPA, the time spent studying and the perceived usefulness of homework assignments in preparing for exams significantly influence homework performance.

INTRODUCTION

The factors influencing performance among undergraduate economics students are of considerable interest to educators. A broad literature (see, for example, Paden and Moyer 1969, Schmidt 1983, Durden and Ellis 1995 and Durden, Ellis and Gaynor 1998) suggests that overall GPA, class attendance, year in school, mathematical aptitude, gender, participation in outside activities, and the number of hours carried exert significant influence on economics performance. Similarly, Romer (1993) concludes that the fraction of homework sets completed is significant in describing economics course grades. Romer's study is consistent with the findings in other disciplines that successful homework completion encourages better academic performance. Indeed, in a broad review of research studies comparing homework with no homework, Goldstein (1960) finds that homework is an important determinant in improving student performance.

The focus of existing homework studies is generally upon the impact of homework grading style on overall student learning. Austin (1979) examines a sample of elementary and secondary school mathematics students. He shows that comments on graded homework assignments are associated with higher exam grades. Pascal, Weinstein and Walberg (1984) confirm these results in their review of studies

examining homework and homework grading strategies. Among the only considerations of economics-related homework, Miller and Westmoreland (1998) find that selective grading of homework questions does not hinder overall student homework performance. They model total homework performance as a function of this selective grading and GPA.

We extend these earlier examinations with a set of new explanatory variables that describe homework grades and the probability of a student earning an A. In the following section, we discuss our method of data collection and introduce our explanatory variables. We then develop a model to test our premises. Empirical results are reported. Concluding remarks are provided in the final section.

DATA COLLECTION

Ninety-eight students in Principles of Macroeconomics, a prerequisite for all business majors, are surveyed about their perception of homework effectiveness during the Spring and Fall semesters of 1999. Students provide information on their GPA's (GPA), hours spent studying course material (HSD), the perceived usefulness (USE) of the homework in exam-preparation and the time (TME) allowed to complete the assignments. Students complete the surveys during the final class meeting and are assured that the surveys are not examined until after the assignment of final grades.

During each semester, six homework assignments are given to the classes seven days prior to the due date. The professor grades each problem on all homework assignments; he supplements the grading with written comments. The final homework average (HW) is calculated as the total number of points earned on the homework assignments divided by the total points possible multiplied by one hundred. Late homework assignments are not accepted absent a valid excuse. Valid excuses include sickness, family tragedy, and school-sponsored events. Students are allowed to work together on the assignments and are not required to attend class. The weight of the homework average in the final course grade (WGT) is .15 during the Spring 1999 semester and .20 during the Fall 1999 semester.

Independent explanatory variables are constructed from student self-reported data. As Principles of Macroeconomics is generally taken during the sophomore year, students have prior GPA's. GPA takes on the value 0 if a student's grade point average is below a 1.0, 1 if the student's GPA is between 1.0 and 2.0, 2 if the student's GPA is between 2.0 and 3.0, and 3 if the student's GPA is between 3.0 and 4.0. HSD takes the value 0 if students report studying between 0 and 4 hours per week, 1 if students report between 4 and 8 hours per week, and 2 if students report between 8 and 12 hours per week.

The variables USE and TME are constructed from student perceptions. Students report whether homework assignments help them to prepare for exams and whether assignments are given with enough advanced warning. The responses "strongly disagree," "disagree," "maybe," "agree" and "strongly agree" take on values of 0, 1, 2, 3, and 4, respectively.

Finally, to allow for gender and race, GEN takes on the value of 0 if the student is female and 1 if the student is male. RACE takes on the value of 0 if the student is African American and 1 if the student is not African American. Fifty-one percent of the students are male and less than 5% are African American.

MODEL

We predict that student performance on homework assignments depends positively on motivation and ability, measured by prior GPA. Student performance depends also on HSD, USE, TME and WGT. We expect to find a positive relationship between each of these four factors and homework performance. Though other studies find that hours spent in outside activities, year in school and the number of hours carried are significant in determining economics course grades, we propose that hours studied for the course proxy for these other potential influences, an assumption that we later confirm.

We estimate the following homework performance equation:

$$HW = b_0 + b_1GPA + b_2HSD + b_3USE + b_4TME + b_5WGT + b_6GEN + b_7RACE + e,$$

where HW denotes homework performance. We first conduct a conventional OLS analysis of the relationships between the independent variables and the final homework average. In the second, LOGIT analysis, a dichotomous dependent variable HW is 1 if the student earned an A average (90-100) on homework assignments and 0 otherwise.

RESULTS

Results of the OLS analysis are provided in Table 1.

Table 1
OLS Estimates

Independent Variable	Parameter Estimate	T-statistic
Intercept	25.209	1.643
GPA	8.934	3.734*
HSD	4.963	2.029**
USE	7.643	2.690*
TME	-0.635	-0.259
WGT	3.843	0.075
GEN	-0.176	-0.066
RACE	9.587	1.471
N	98	
R^2	0.291	
F[7,90]	5.28*	

* Significant at the 1% level.
** Significant at the 5% level.

We find that prior GPA, hours spent studying for the class (HSD) and the perceived usefulness (USE) of the homework for exam preparation are positively and significantly related to the final homework grade. No other variable in the homework performance equation is statistically significant. These results are robust to tests for heteroskedasticity and multicollinearity. Further regression results (not reported here) show that hours spent in outside activities, year in school, and the number of hours carried are also not significant in the determination of homework performance.

The implication of the sign and significance of the USE variable is noteworthy. The perception that homework assignments help students prepare for exams motivates students to higher quality homework performance. This parameter estimate is significant at the 5% level.

Binomial logit results in Table 2 further support these findings.

Table 2
LOGIT Estimates

Independent Variable	Parameter Estimate	T-statistic
Intercept	-18.208	-3.923
GPA	2.237	3.653*
HSD	0.216	0.432
USE	1.050	1.841***
TME	0.261	.525
WGT	39.642	3.399*
GEN	0.384	0.714
RACE	1.504	0.783
N	98	
$R(p)^2$	0.786	
Log-Likelihood Ratio	35.538*	

* Significant at the 1% level.
*** Significant at the 10% level.

Parameter estimates for GPA and USE are positive and significant. As well, the probability of an A increases significantly with WGT. However, this result is weakened by potential collinearity between the WGT variable and other differences between the two survey semesters. This significance disappears if the dependant variable is defined as the probability of an A or a B.

CONCLUSION

We examine non-grading factors influencing Principles of Macroeconomics homework performance. We find that GPA, hours of study and student perception of the usefulness of homework assignments in preparing for exams increase students' homework performance. However, only GPA and student perception of the

homework's usefulness for exam preparation are significant across model specifications. Instructors seeking to motivate student homework activity should ensure a clear link between homework material and exam content.

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DEREGULATION OF PRICING: DOES IT IMPROVE ANYTHING?

Jerry L. Crawford, Arkansas State University

ABSTRACT

It is not generally recognized that effective price controls necessarily cause surpluses or shortages in markets. The answer depends very much on the degree of competition prevailing in the specific market being affected. There is a significant difference in the impact of price regulation in competitive markets as contrasted with more imperfectly competitive markets. A primary purpose of this paper is to bring attention to this somewhat neglected reality.

INTRODUCTION

Lawmakers and business leaders have promoted the shift from monopoly electric power to competition as a breakthrough that would cut power cost and help a state's economy. The idea is to encourage competition by setting up a wholesale power market and allow consumer; business and residential, to choose their own supplier.

Twenty states have now made a commitment to deregulate following an initial move by California to deregulate power a year ago. The early efforts to deregulate have not yet panned out to produce lower electricity rates Nevertheless, many states including Arkansas have made commitment to deregulate. The basic appeal to deregulate seems to be the prospect of lowering the cost of doing business in a state. If in fact it will achieve this, then that would benefit the population of a state and provide additional job opportunities.

The deregulation efforts so far, which focus on bringing down the cost of electricity to consumers, have been led by states where power costs are high. Areas with higher electricity process benefit most from deregulation since price differentials result primarily from past investments in unusually expensive generating facilities. The areas with facilities reflecting the current state of technology have the lower electricity prices. The issue may be one primarily of competition between the "old"and the "new" type facilities.

There seem to be many significant "ifs" in this movement to deregulate electricity. The purpose of this study is to make use of models to guide us in evaluating the impact of deregulation as compared to an environment of regulation. This is an issue of current significance and should not be left to an uninformed general public without the benefit of some economic analysis.

Almost every Principles of Economics student learns that when a regulated price lower than the equilibrium price is imposed, a shortage of that product is the result. Beginning students also learn that whenever a price is established greater than the equilibrium level, a surplus develops in the market. The tendency is to develop generalizations about the effectiveness of government price controls on such areas as minimum wages and electricity pricing. The outcome really depends upon the degree of competition prevailing in the market being evaluated.

It is not generally recognized that effective price controls necessarily cause surpluses or shortages in markets. The answer depends very much on the degree of competition prevailing in the specific market being affected. There is a significant difference in the impact of price regulation in competitive markets as contrasted with more imperfectly competitive markets. A primary purpose of this paper is to bring attention to this somewhat neglected reality.

SETTING PRICES IN COMPETITIVE MARKETS

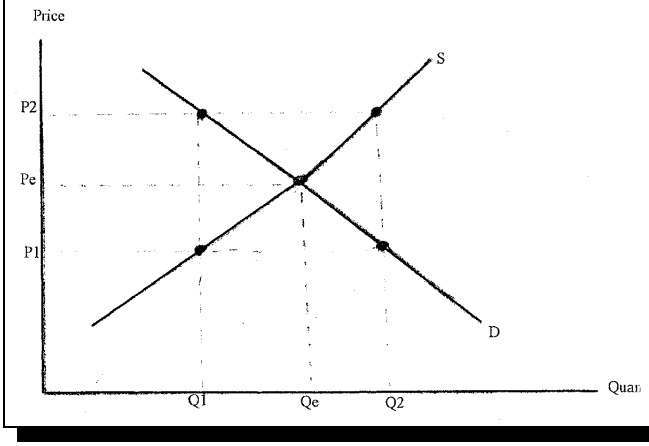
Figure I illustrates a standard model of pure competition Pure competition as defined in standard text books would result in Pe and Qe being the equilibrium. Any attempt to achieve a lower price, such as P1, would result in a shortage as measured by the distance Ql-Q2. Price regulation would bring on the need for some way to deal with this shortage. Furthermore, any attempt to establish a higher price, such as P2, would result in a surplus as measured by the distance Q1-Q2. Price regulation would bring on a need to deal with this surplus. As a consequence with large numbers of independently acting buyers and sellers as characterize a competitive market, price setting causes shortages or surpluses. A strong case can obviously be made for leaving the market alone.

SETTING PRICES IN IMPERFECTLY COMPETITIVE MARKETS

In this circumstance the somewhat well defined supply and demand functions become less so. In order to explore this type situation, two models are presented Model A demonstrates the impact of price controls on monopoly or oligopoly firms supplying some good or service. Model B demonstrates the impact

of price controls(minimum wage legislation) on monopsony or oligopsony firms demanding labor services.

Figure 1
Perfect Competition



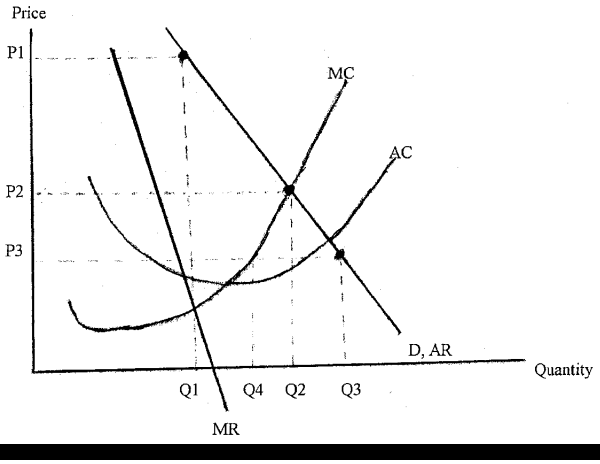
In model A (Figure 2), standard economic analysis would call for the firm to maximize profit at P1 and Q1, and no shortage of the firm's product would exist If we now impose a price ceiling at P2, there will be a change in the firm's behavior. The firm's MR curve is now horizontal at P2 until Q2 is reached. The marginal or additional revenue in this range is the same as the regulated price. For points beyond Q2, the firm's MR curve is the original and declines as output becomes higher. In summary, with the imposition of P2 as the ceiling price, the firm's marginal revenue curve is horizontal at P2 until output is a Q2; at this point MR becomes a vertical line and reverts to the original MR beyond Q2.

At the ceiling price, the imperfectly competitive firms supplies a larger quantity at a lower price than was the situation prior to regulation. The firm demonstrated here still earns an economic profit, but not as much as before regulation. The consumer gets more product and at a lower price than before. Furthermore, as long as the ceiling price is set no lower than P2, where marginal cost interests the demand curve, a shortage would not occur.

If the price were set a P3, a shortage would occur. At any price below P2, quantity demanded tends to increase as the price is lowered while quantity supplied decreases. An illustration of this is to look at P3 where quantity demanded is Q3. The firm would supply only Q4 since this is where MR=MC at that output level. The

consequence would be a shortage. In summary, as long as price is set at level P2 or above, no shortage of product will tend to result.

Figure 2
Imperfect Competition



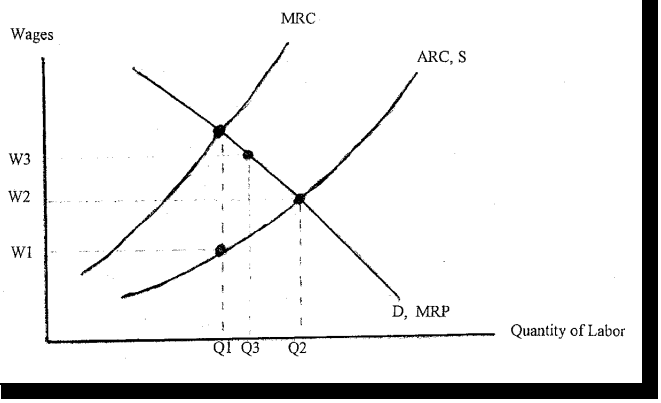
Another possibility not illustrated in this paper would be where demand is so weak that the intersection of MC and the demand curve is below the average cost curve. If prices are set below this level, the continued existence of the firm would be in question. A firm must cover all costs in the long run or it ceases to operate.

Figure 3 illustrates the impact of price controls (minimum wage legislation) upon monopsony or oligopsony firm's demand for labor. This figure is utilizing the conventional concepts; Marginal Revenue Product, Marginal Resource Cost and Supply Curves for labor in a market. If there is no regulation whatever, the firm will follow its self-interest instincts and hire Ql units of labor and pay W1 as a wage rate. This is the standard monopsony model discussed in most Principles of Economics books.

If the government establishes a minimum wage at W2, the effect will be that no labor can legally be supplied at rates below that and the marginal resource cost of labor will be horizontal at that level. The consequence is that MRP=MRC at W2 and Q2. The requirement that the higher wage, W2, be paid has the effect of being associated with a higher level of employment, Q2. Also, there is no surplus of labor at this higher wage rate. On the other hand if an even higher wage rate were established as the minimum wage level, the consequence would be lower

employment level. For example, if W3, were established as the minimum legal wage rate, only Q3 would be employed.

Figure 3
Minimum Wages



In conclusion, there is a range in which a higher minimum wage may even produce more jobs by eliminating the monopolistic employer's motive for restricting employment. It might also be argued that an effective minimum wage could increase productivity which would shift the MRP(demand curve) for labor to the right. This could result from a "shock" effect causing firms to use labor more efficiently or could result from an improvement in workers vigor, motivation, etc which contribute to productivity. The models shown do not establish these latter points, but they do support the previously made points, but they do support the previously made point that higher wages do not necessarily result in less employment and may even be associated with more.

CONCLUSION

The main point to be gotten from the above somewhat simple use of conventional concepts is that government involvement in the regulation of pricing is not necessarily bad. As has been demonstrated, when monopoly elements exist, requiring a reduction of price can result in an increase (not decrease) in the quantity supplied. What essentially happens is that part of the return to the monopolist for restricting output are removed, and no shortage occurs.

It has been similarly demonstrated that minimum wage legislation does not necessarily have the effect of causing more to be unemployed. Indeed, as was demonstrated, the final effect could well be more employment as we remove the monopolistic employer's motive for restricting employment.

As we consider the implications of the current movement to deregulate the pricing of electricity, perhaps more thought needs to be given to whether the electric industry is competitive or monopolistic. A major indicator of monopolistic market structure would be the existence of long term economic profit. Those who have already objectively studied the electricity industry should know the answer even now.

The natural regulator of the market is competition. Where it is found to not exist, it would be appropriate to conclude that we either attempt to establish it or that government has some proper role to play. As Adam Smith said, the proper role for government is to do those things needed and necessary but not being provided by any other means.

THE TEXAS LOTTERY: A PEDAGOGICAL EXAMPLE INTEGRATING CONCEPTS OF INCOME TAXATION, TIME VALUE OF MONEY, AND IRR

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Grady Perdue, University of Houston-Clear Lake

ABSTRACT

This study presents a teaching exercise for a basic economics or finance class. The question posed to students is whether it is better as a lottery winner to receive a lump-sum settlement or the annuity. The exercise is designed to teach students how to integrate multiple considerations into the economically proper choice. These considerations are the implications of the progressive income tax system, the time value of money, and the implicit rate of return associated with the two alternative payment mechanisms.

INTRODUCTION

If you are purchasing a lottery ticket, is it better to receive your winnings as a lump-sum cash payment or as a series of payments over a number of years? There are two choices on a lottery that the State of Texas advertises as a $4,000,000 lottery jackpot. With option number one you receive the $4,000,000 as an annuity due spread across 25 annual payments. These payments will equal $160,000 each, for a total of $4,000,000. With option number two you receive a lump-sum cash payment of $2,000,000, 50 percent of the lottery's advertised value, which is the approximate present value of the annuity due. Remember that you are required to choose your option at the time you purchase the ticket. Also remember that taxes are involved. Now, which option is the best choice?

This lottery question is a review exercise we pose to our introductory business finance students shortly before the course's mid-term exam. This point in the class has introduced students to the time value of money, the personal income tax

brackets, and internal rate of return. This "personal finance" problem requires them to integrate their knowledge of both topics to make an analytical decision in choosing one of the options. This problem will also give them additional practice in using a financial calculator or the financial tools in a computer spreadsheet. By working through the examples discussed below, students learn to include tax considerations into what initially seems to be a relatively simple time value of money problem.

Without endorsing or opposing the lottery concept itself, we recognized that the Texas lottery presents us an opportunity for a "real world" application to which many students can quickly relate. Most of our students have some familiarity with the lottery in Texas-either from the personal purchase of tickets or from being exposed to the lottery's extensive advertising campaign. For those who have purchased a ticket, they know personally that the sales clerk always asks at the time of purchase whether the purchaser wants the "cash option" or the annuity. The choice made at the time of purchase of a lottery ticket is a binding decision that determines the payment schedule to be followed if the purchaser of the ticket wins the lottery. Therefore, this is a decision that many students have made before, but perhaps without any solid financial basis for their decision. The students are immediately intrigued with this puzzle, wondering "did I do the right thing" with previous purchases.

We quickly have to put a couple of constraints on the problem, the primary one being that the students are to ignore all non-financial considerations. This is purely a wealth maximization problem. The current desire for a new sports car or a month-long vacation in Paris is to be set aside. Likewise, students are asked to ignore extreme cases such as the 97 year-old purchaser of lottery tickets who probably will not live to see 25 annual payments. The second constraint is that we must assign the pre-lottery levels of taxable income, to ensure that the students are all working on the same problem. The final constraint is that to simplify the analysis we allow the students to assume that the pre-lottery taxable income of the lottery winner will be constant for the next 25 years. This is somewhat unrealistic, but it does no harm to the pedagogy of the lesson. Factoring in a growth rate for pre-lottery income would complicate the problem without substantially increasing learning.

It should be noted that we are using the definition of "taxable income" used by the Internal Revenue Service. An individual completing a 1040 income tax form reports income and makes certain adjustments, then subtracts allowable exemptions and deductions (whether standard or itemized). The income that remains is "taxable income" and is reported on Line 39 of the Form 1040. It is "taxable income" that is taxed. In this problem we do not concern ourselves with total income, the amount of adjustments, exemptions or deductions. We start the analysis with taxable income.

Students are told to assume six specific levels of taxable income, and to determine if the family in each case is better off with the cash settlement or the

annuity due. Regardless of the level of income, in this study each dollar of additional income results in an additional dollar of taxable income.

For the year 2000 our students are being told to assume six different pre-lottery taxable incomes. The first level is zero taxable income. The next four income levels are $21,925, $74,900, $133,700, and $224,900. These income levels are, respectively, the midpoints of the 15 percent, 28 percent, 31 percent and 36 percent income tax brackets. Finally $288,350 is the last income level. This is the start of the 39.6 percent bracket, so any income received from the lottery will be taxed exclusively at 39.6 percent. Table 1 presents the year 2000 personal income tax tables for a married couple filing jointly, and is the table we are using in our classes in 2000.

THE ANALYSIS

Regardless of which of the six levels of income the student is analyzing, the student quickly discovers that certain steps must be followed in the analysis. First the student must analyze the pre-lottery case and calculate the taxes due and the after-tax income. (Since we assign taxable income, issues of exemptions, deductions, and other confounding variables are swept aside as irrelevant to the lesson.) Then the student analyzes the implications for the change in after-tax income that results from winning the lottery, assuming they receive the annual payments. Next the student must determine the impact on taxable income if the couple wins the lottery and receives the lump-sum payment. Finally the student must find the rate of interest that equates the after-tax cash flows from the two means of payment.

As an example of the calculations, we demonstrate below the case of a married couple with a pre-lottery taxable income of $21,925. Utilizing the information from Table 1, the student determines that the couple with $21,925 in taxable income is in the 15 percent marginal tax bracket. The student then calculates taxes due to be $3,288.75 and after-tax income to $18,636.25.

Tax due = $21,925*0.15 = $3,288.75
After-tax income = $21,925-$3,288.75 = $18,636.25

With this step completed the student is ready to adjust lottery winnings to after-tax income. Since we have given the student the "pre-lottery" taxable income, the student must determine taxable income post-lottery for both an annuity due and a cash settlement.

In the second step the student is ready to address the annuity due option. Students determine that the annual annuity due payment from the lottery is $160,000 per year for 25 years. This amount is added directly to pre-lottery taxable income, then the revised values for taxes and after-tax income are determined. (This after-tax income will be important in the next step.) For the family with $21,925 in pre-lottery taxable income, the $160,000 annuity increases taxable income to $181,925. Utilizing the information from Table 1, the student finds the new marginal tax bracket to be 36 percent. The student calculates tax due to be $48,541.50, and after-tax income to be $133,383.50. The increase in after-tax income resulting from the annuity payment is $114,747.25.

Tax due = $41,170.50 + ($181,925-$161,450) *0.36 = $48,541.50
After-tax income = $181,925-$48,541.50 = $133,383.50
Increase in after-tax income = $133,383.50-$18,636.25 = $114,747.25

A major difficulty many students have is realizing that this is a marginal analysis, since they need to use marginal values later when they solve for the rate of return that will equate the annuity due and the lump-sum payment. Unless guided by the instructor, many students fail to calculate the increase in taxable income, which is crucial to analyzing the problem.

In the third step of the analysis the student adds the $2,000,000 lump-sum payment to the pre-lottery taxable income of $21,925, and increases taxable income to $2,021,925. Utilizing the information from Table 1, the student finds the new marginal tax bracket to be 39.6 percent. The student calculates tax due to be $773,350.20 and after-tax income to be $1,248,574.80. The increase in after-tax income resulting from the lump-sum lottery payment is $1,229,938.55.

Tax due = $86,854.50+(2,021,925-$288,350)*0.396 = $ 773,350.20
After-tax income = $2,021,925-$773,350.20 = $1,248,574.80
Increase in after-tax income = $1,248,574.80-$18,636.25 = $1,229,938.55

Table 1
2000 personal income tax table
for persons married and filing jointly

Income Over	But not over	Tax of excess over	
$0	$43,850	15%	--$0
$43,850	$105,950	$6,577.50 plus 28%	--$43,850
$105,950	$161,450	$23,965.50 plus 31 %	--$105,950
$161,450	$288,350	$41,170.50 plus 36%	--$161,450
$288,350	---	$86,854.50 plus 39.6%	--$288,350

Once the student has completed the determination of the after-tax cash flows, the time value of money may finally be included in the analysis. To solve this problem the student must compare the *increase* in after-tax income that results from each option-not just simply after-tax income. The relevant values, when the student solves for the internal rate of returns in the last step, are the values of $1,229,938.55 for the lump-sum payment and $114,747.25 for the annuity due.

Using a financial calculator (or the financial functions in a spreadsheet as in the Appendix), the student solves for the interest rate that equates the after-tax increase in income that results from the lump-sum payment and the annuity due:

PV	=	-1,229,938.55
FV	=	0
PMT	=	114,747.25
N	=	25
I	=	?

The internal rate of return solution (I) for this particular problem is found to be 8.9843 percent.

The final challenge for students is to interpret the meaning of the value of 8.9843 percent. For some students interpretation of the results is more difficult than the actual analysis. The solution in this particular example tells the student that 8.9843 percent is the after-tax rate of return the imaginary lottery winner must earn from the lump-sum payment to make it equal to the annuity due. Table 2 presents the internal rate of return solution for all six of the income levels used in this class exercise. The internal rates of return range from 9.4688 percent to 6.9696 percent.

Table 2
The $4,000,000 lottery

Pre-lottery taxable income	Pre-lottery marginal tax bracket	Amount of lottery payment	Method of lottery payment	Post-lottery marginal tax bracket	Internal rate of return
$0	0.00	$160,000	annuity	31.0	9.4688
$2,000,000			lump-sum	39.6	
$21,925	15.0	$160,000	annuity	36.0	8.9843
	$2,000,000		lump-sum	39.6	
$74,900	28.0	$160,000	annuity	36.0	8.2172
	$2,000,000		lump-sum	39.6	
$133,700	31.0	$160,000	annuity	39.6	7.7766
		$2,000,000	lump-sum	39.6	
$224,900	36.0	$160,000	annuity	39.6	7.2372
		$2,000,000	lump-sum		39.6
$288,350	39.6	$160,000	annuity	39.6	6.9696
		$2,000,000	lump-sum	39.6	

This value of 8.9843 is an after-tax rate of return. The before-tax rate of return must be even higher. The instructor queries the students on the likelihood of being able to earn this required rate of return. This allows the instructor to bring in a special set of data and extend the discussion. We bring in the lbbotson (1997) financial market data that reports long-run rates of return on stocks and other assets classes. The lbbotson data for the period 1926-1996 reports the following long-run geometric mean rates of return and standard deviations for these six asset classes:

	Rate of Return	Standard Deviation

Large company stocks	10.7%	20.3%
Small company stocks	12.6	34.1
Long-term corporate bonds	5.6	8.7
Long-term government bonds	5.1	9.2
Intermediate-term government	5.2	5.8
U.S. Treasury bills	3.7	3.3

At this point the instructor demonstrates that even with 100 percent of the return in the form of long-term capital gains which are taxed at only 10 percent, the investor would require a pre-tax return of 9.9826 percent to earn the 8.9843 percent after-tax return:

8.9843% = 0.9 = 9.9826%.

In light of the Ibbotson data we ask the students in the class what they believe is the probability of an investor earning 9.9826 percent on a pre-tax basis (or 8.9843 percent on an after-tax basis). Most students feel that this goal is beyond the abilities of the average investor. Putting the question differently we then ask the students to assume they put 100 percent of the lump-sum value into the stock market. Still making the over-simplifying assumption that all returns are long-term capital gains taxed at 10 percent, the expected long-run after-tax returns on stocks (based on the historical data) are

Large company stocks	10.7% * 0.9 = 9.63%
Small company stocks	12.6% * 0.9 = 1 1.34%.

Given the Ibbotson data (and despite recent stock market performance), most students recognize by this point in the class that the lump-sum payment is not nearly as attractive as they may have once thought. From the perspective of wealth

maximization, most students decide that the annuity is the superior choice for this couple.

Additional observations can be made in the class once the students have performed similar analyses for the other assigned income levels, and completed Table 2. They quickly note that the annuity/lump-sum choice has different implications for persons in different marginal income brackets. Students see that the lower an individual's pre-lottery marginal tax bracket, the less attractive is the lump-sum payment. Yet the consensus opinion of our students is that as a rule of thumb, less wealthy persons are more likely to want the instant wealth of the lump-sum payment. They believe it is the upper income individuals who may really have a chance of making the lumpsum payment an attractive option.

Table 3
IRRs for various size lotteries and various pre-lottery taxable incomes

Pre-lottery taxable income	$4,000,000 lottery	$6,000,000 lottery	$8,000,000 lottery	$10,000,000 lottery
$0	9.4688	8.8993	8.5352	8.2284
$21,925	8.9843	8.5645	8.2325	7.9842
$74,900	8.2172	7.9675	7.7212	7.5724
$133,700	7.7766	7.5101	7.3759	7.2951
$224,900	7.2372	7.1483	7.1037	7.0769
$288,350	6.9696	6.9696	6.9696	6.9696

In previous semesters students have asked us two particularly intuitive "what if" questions. We have been asked about raising the assumed pre-lottery taxable income beyond the values shown. We simply asked the class to experiment with any higher level of income (beyond $288,350) of their choosing. They quickly discovered that the internal rate of return on this problem never goes below 6.9696 percent. We have also been asked about the implications of a larger lottery. We have had the students work through that problem also. Table 3 shows the implications of four different lotteries, with the largest being valued at $10,000,000. As would be expected, the internal rate of return still has a minimum value of 6.9696 percent.

CONCLUSION

We have found the lottery problem to be an interesting exercise for students and an effective learning tool. While the subject of the exercise may seem somewhat light-hearted, we have found it to be effective in helping students with calculating after-tax cash flows, understanding concepts in the time value of money, and working with a financial calculator (or spreadsheet). Our students tell us that this exercise does help prepare them for the upcoming examination.

REFERENCES

Brigham, E. F., L. C. Gapenski & M.l C. Ehrhardt. (1999). *Financial Management: Theory and Practice*, ninth edition. Fort Worth: The Dryden Press.

Stocks, Bonds, Bills, and Inflation 1997 Yearbook (1997). Chicago: Ibbotson Associates.

APPENDIX

Excel spreadsheet for computations in exercise

	A	B	C	D	E	F	G	H
1				Income Tax Table				
2	Income At least	but less than	Tax +	Percent of Excess				
3	0	43850	0	0.15		Lotto jackpot	4000000	
4	43850	105950	6577.5	0.28		Income level	21925	
5	105950	161450	23965.5	0.31				
6	161450	288350	41170.5	0.36				
7	288350		86854.5	0.396				
8								
				9Tax Consequences of Selecting 25 Payments				
10	Taxable Income	Total tax	After tax income	Lotto win- 25 years	Total income	Total tax	After tax income	Increase in after tax income
11	21925	3288.75	18636.25	160000	181925	48541.5	133383.5	114747.3
12								
13				Tax Consequences of Selecting Lump Sum Payment				
14	Income	Total tax	After tax income	Lotto win- lump sum	Total income	Total tax	After tax income	Increase in after tax income
15	21925	3288.75	18636.25	2000000	2021925	773350.2	1248575	1229939
16								
17				Income levels and corresponding IRRs				
18	Income	IRR						
19	21925	0.089843						

PREPARING THE SPREADSHEET

For the formulas reported below to work, the spreadsheet must be completed exactly as presented.

To prepare this spreadsheet, simply fill in rows 1-7 with the numbers as they appear in the spreadsheet. Fill in any text exactly as shown. Rows 11, 15, and 19 must have the formulas as shown below.

After this has been created the user of the spreadsheet only needs to change cells G3 and G4 to evaluate any jackpot level and any income level. The values in row 11, 15, and 19 will automatically be changed as a result of changing the values in either/both cells G3 or G4.

Row 11

A11: =G4
B11:=VLOOKUP(A11,$A$3:$D$7,3) + VLOOKUP(A11, $A$3: $D$7,4)
*(Al 1-VLOOKUP(A11, $A$3:$D$7,1))
C11: =A11-B11
D11: =$G$3/25
E11: =A11 +D11
F11: =VLOOKUP(E11,$A$3:$D$7,3) +VLOOKUP(E11,$A$3:$D$7,4)
*(Ell -VLOOKUP(E11, $A$3:$D$7,1))
G11: =-E11-F11
H11: =G11-C11

Row 15

A15: =G4
B15: =VLOOKUP(A15,$A$3:$D$7,3)+VLOOKUP(A11,$A$3:$D$7,4)
*(A15-VLOOKUP(A15, $A$3:$D$7,1))
C15: =-A15-B15
D15: =$G$3/2
E15: =A15+D15
F15: =VLOOKUP(E15,$A$3:$D$7,3)+VLOOKUP(E15,$A$3:$D$7,4)
*(E15-VLOOKUP(E15, $A$3:$D$7,1))
G15: =-E15-F15
H15: =G15-C15

Row 19

A19: =G4
B19: =RATE(25,H11,-H15„1)

EFFECTS OF GENDER AND PERSONALITY ON STUDENT PERFORMANCE IN PRINCIPLES OF ECONOMICS

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ABSTRACT

This paper seeks to identify those factors that influence a student's learning in college macro- and microeconomics courses. Student and teacher personality type, gender, major, college-entrance exam scores, and overall GPA were correlated with student learning, measured by taking the difference in the Test of Understanding College Economics III (TUCE) pre- and post-test. By identifying those variables that affect learning, we hope to ultimately make suggestions on how to improve the teaching style for college principles of economics classes.

INTRODUCTION

This paper seeks to identify factors that influence a student's performance in college principles of macro- and microeconomics courses. Using student improvement, as measured by the difference in pre- and post-test scores on the Test of Understanding College Economics III (TUCE), personality type as determined by the Keirsey Temperament Sorter, the overall grade point average, ACT score, gender, major, and teacher personality as variables, we have attempted to draw some conclusions that will help economics instructors to meet the needs of our often dismally performing students. As female professors of economics at a university where teaching is the top priority, we were especially concerned about the possibility of relatively poor performance by women in economics courses.

The educational literature suggests that women tend to score relatively worse than men on quantitative material assessed on a time-constrained multiple-choice test (Greene, 1997). As economics courses are becoming increasingly quantitative (Becker, 1997) and professors are relying heavily on time-constrained multiple-choice question tests (Siegfried, Saunders, Stinar, and Zhang, 1996), this would suggest that women would perform significantly worse than men in economics

classes. This persists beyond graduation. Hirschfeld, Moore, and Brown (1995) find that women, even those with the same economics GPA and SAT scores, score 40 points lower on the GRE Subject Test for Economics.

In this paper we are attempting to identify factors that influence a student's performance in college principles of economics courses. We hypothesized that performance might be influenced by factors other than gender, specifically, such as personality type, major, ability of the student, effort put forth by the student, and teaching style of the teacher. We began evaluating our principles of macro and micro students at Jacksonville State University (JSU) in the winter semester 1997. On the first day of class the students took the TUCE III pre-test. Later in the semester they took the Keirsey Temperament Sorter, and then during the final exam they took the post-test, where correct answers earned them extra credit points. We repeated this cycle of events throughout the summer of 1998. We will briefly review the literature on student achievement in principles of economics classes with regards to gender and personality type. We then provide a brief explanation of the different personality types and the TUCE III. Next we describe the JSU data, our analysis, and the results. Last, we offer some possible explanations of our findings and propose some areas for future research.

LITERATURE REVIEW

Research on improving economic education at the college and university level has been extensive, although it has diminished significantly since 1980 (Becker, Highsmith, Kennedy, Walstad, 1991) However, this research has seldom focused on meeting the needs of women and of those with different personality types. In the first paper of its kind, Borg and Shapiro (1996) found that personality type is an important factor in the economics student's performance. They used the Myers-Briggs Type Indicator to determine personality and the course grade to determine the student's mastery of the material. They found gender to be insignificant. However, other authors suggest that frequently women struggle in economics courses, often dropping out before the first test (Greene1997), performing worse overall than males, and leaving many more questions blank on the GRE Economics Subject Test (Hirschfeld, Moore, Brown 1995). According to Arnold (1992), over their college years, women often lose confidence needed to handle economic problems. They also require more cues, such as good grades, to persist in economics courses (Becker 1997). Weltzel, Potter, and O'Toole (1982) found that the greater the difference between an instructor's teaching style and a student's learning style, the worse a student performs in principles of economics and the less he/she likes it. Thus, personality type and gender, we believe, might influence how a student assimilates economics information from a particular instructor. Since 83% of the economics

instructors in the US are male (Becker 1997), knowledge of such a relationship may be helpful in improving female performance in economics.

PERSONALITY TYPES

The Keirsey Temperament Sorter is a 70-question multiple-choice questionnaire. Although the Keirsey Test is both less complex and less expensive than the Myers-Briggs Test, it also has a high degree of accuracy and is used interchangeably by many university campuses. The students' answers determine what their preferences are on four scales: where the student likes to focus his/her attention (E or I); the way a student looks at things (S or N), the way a student likes to decide things (T or F); and how the student deals with the outer world (J or P) (Consulting Psychologists Press, 1976). The 4 areas of choice are described in more detail below (Lawrence 1982):

1.	E = Extroversion.	The person's interest flows mainly to the outer world of actions, objects, and persons, or,
	I = Introversion.	The person's interest flows mainly to the inner world of concepts and ideas.
2.	S = Sensing	The person prefers to focus on the immediate, real, and practical, or,
	N = Intuition.	The person prefers to focus on the possibilities, relationships, and meanings.
3.	T = Thinking	The person makes decisions objectively, impersonally, logically, or,
	F = Feeling.	The person bases decisions primarily on values, subjectively.
4.	J = Judgment.	The person prefers to live in a planned and orderly way, having things settled, or,
	P = Perception.	The person prefers to live in a spontaneous, flexible way, preferring to keep options open.

We measured improvement in the level of economics knowledge by giving all of our principles students the TUCE III test at the beginning and end of the

semester. The TUCE III consists of two (one for microeconomics and one for macroeconomics) 33-question, four-option, multiple-choice tests. According to Philip Saunders (1991) one of the main goals of the TUCE is to measure improvement in college introductory economics courses. About 70% of the questions are designed to assess student aptitude in applying economics to solving problems. Since 1968 the only consistently significant variable to influence post-TUCE scores are pre-aptitude measures, such as the pre-test and the SATand ACT (Becker 1997). A committee consisting of many economists long involved in the economic education of college students selected, wrote, and edited the questions on the TUCE exam (Saunders 1991). An extensive review process followed. Borg and Shapiro (1996) chose to use grades, not the TUCE, to measure economic performance: They claimed that the TUCE is no more objective than an individual professor's own test and that the TUCE reflects the personality types of the professors who composed it. Although their argument has merit, our goal was to measure the level of improvement in the course, not just the final grade. In order to improve our teaching of economics, we believed that whether a student comes in weak or strong in economics on the first day of class, our success in teaching should be based on how much that student has improved by the end of the course.

METHODOLOGY

The data consist of observations on 106 students in principles of macroeconomics courses and 83 students in microeconomics courses taught from spring 1997 through summer 1998. The actual number of students in the sections was much larger; however, many students had not taken the ACT. Since the ACT score proved to be a significant factor in our research, the results for students without ACT scores are not included in the sample. Also, some of the students had post-test scores that were lower than their pre-test scores. We assume that the negative scores and those showing no change were due to lack of motivation, since the post-test TUCE score had a minimal effect on their course grade. (Students were given ½ point added to their final exam grade for each correct answer on the post-test). These students were also deleted from the final samples. The following variables were recorded for each student in the final sample.

DIFF	The difference between the pre-test and post-test score on the TUCE

GEN	Gender
TCH	Teacher
PER	Personality type
MAJ	Major
GPA	The student's grade point average on all courses at this university
ACT	The student's score on the American College Test

DIFF, the improvement in the TUCE score, is a measure of how much the student learned in the class. A larger DIFF indicates that the student learned more in the course. In order to measure learning in the course, rather than simply knowledge of economics, we used the change in scores instead of the post-test score**.** GEN indicates the gender of the student, so that we could see if our students followed the typical result of men outperforming women. TCH represents the two teachers, both of whom are female. Their personalities differ slightly; one is ESTJ, and the other is ESFJ. PER represents one of sixteen possible personality types. In our sample the types represented were as displayed in Table 1A.

MAJ indicates if the student is a business major or other major. ACT**,** the score that the student made on the American College Test, represents a rough approximation of the student's ability or aptitude. We would expect a positive relationship between ACT and DIFF. GPA, the student's grade point average, serves as a measure of the amount of effort the student has put into his or her studies. GPA should be positively related to DIFF.

First we performed simple t-tests and analysis of variance to compare DIFF, the performance variable, between male and females and different personality types. In addition, in order to determine the importance of personality, ability, effort, teacher, gender, and major on DIFF, the amount learned, we regressed these variables on DIFF. In the regression analysis, GEN, TCH, and PER were represented by dummy variables.

Table 1A
Gender and Personality – Macroeconomics Sample

Personality Type	Number of Men	Number of Women	Total
ESTJ	4	9	13
ESFJ	9	22	31
ENFJ	5	7	12
ENFP	6	5	11
ISTJ	8	4	12
ISFJ	4	18	22
INFJ	1	4	5
Total	37	69	106

Table 1B
Gender and Personality – Microeconomics Sample

Personality Type	Number of Men	Number of Women	Total
ESTJ	11	8	19
ESFJ	7	11	18
ESFP	1	4	5
ENFP	3	4	7
ISTJ	4	4	8
ISFJ	5	10	15
INTJ	1	4	5
INFJ	3	3	6
Total	35	48	83

EMPIRICAL RESULTS

The t-tests for differences in the means of DIFF for men and women in macroeconomics revealed that the average DIFF for the sixty-nine women was 5.0; for the 37 men, 4.2. The difference was significant at the 8% level. In microeconomics, the average DIFF for the 48 women was 4.4; for the thirty-five men, 4.0. The difference between men and women was not significant in the microeconomics classes. When improvement among personality types was compared, analysis of variance found no significant difference between the average scores of the different personality types in either of the two courses. The average values for DIFF for each personality type are given below in Table 2A and 2B.

Table 2A
Average DIFF for Personality Types in Macroeconomics

Personality Type	Average DIFF
ESTJ	3.5
ESFJ	4.6
ENFJ	5.8
ENFP	5.3
ISTJ	5.6
ISFJ	4.5
INFJ	3.0

Although the DIFF variable ranged from a low of 3.0 for INFJ's to a high of 5.8 for ENFJ's in macro and a low of 2.3 for ENFP's to a high of 6.0 for INFJ's in micro, the means were not significantly different, probably because there were relatively few observations of each of these personality types in the two samples (See Tables 1A and 1B).

Since several of the personality types in our sample contained less than ten students, we tested DIFF for opposite personality types; i.e., Extrovert vs. Introvert, Sensing vs. Intuitive, Thinking vs. Feeling, and Judging vs. Perceiving. The results are shown below in Tables 3A and 3B.

Table 2B
Average DIFF for Personality Types in Microeconomics

Personality Type	Average DIFF
ESTJ	4.3
ESFJ	4.2
ESFP	4.2
ENFP	2.3
ISTJ	5.4
ISFJ	3.9
INTJ	4.2
INFJ	6.0

Table 3A
Average DIFF for Broad Personality Types
(E vs. I, N vs. S, F vs. T, J vs. P) in Macro

Personality Type	Number of Students	Average DIFF
Extrovert	67	4.73
Introvert	39	4.62
Sensing	78	4.54
Intuitive	28	5.11
Thinking	25	4.52
Feeling	81	4.74
Judging	95	4.62
Perceiving	11	5.27

Table 3B

Average DIFF for Broad Personality Types (E vs. I, N vs. S, F vs. T, J vs. P) in Micro

Personality Type	Number of Students	Average DIFF
Extrovert	49	3.98
Introvert	34	4.59
Sensing	65	4.28
Intuitive	18	4.06
Thinking	32	4.56
Feeling	51	4.02
Judging	71	4.22*
Perceiving	12	3.08*

*Significantly different at the 3% level.

In macro, Extroverts scored slightly than Introverts; Intuitive, higher than Sensing; Feeling, higher than Thinking; and Perceiving, higher than Judging. However, none of these differences was significant. In micro, Introverts scored slightly higher than Extroverts; Sensing, higher than Intuitive; and Thinking, higher than Feeling, these scores were not significantly different. However, the students with Judging personalities scored significantly better than those with the opposite personality type, Perceiving. Although not statistically significant, the personality types that should most improvement in macro, Extrovert, Intuitive, Feeling, and Perceiving, were opposite those that performed best in micro, Introvert, Sensing, Thinking, and Judging.

The basic empirical model used in ordinary least squares estimation was:

$$DIFF = f(MAJ, GPA, ACT, GEN, TCH, PER)$$

The results for macro sample, which contained 7 personality types, are found in Table 4A.

Table 4A
Regression of Personality, GPA, ACT, Teacher, Gender & Major on Macro DIFF

Variable	Coefficient	T-Statistic
MAJ	.28	.45
GPA	-0.24	-1.40
GEN	-1.29	-1.97**
TCH	-0.61	-1.07
ACT	0.18	2.43***
ESTJ	1.23	.79
ESFJ	2.02	1.43
ENFJ	3.44	2.19**
ENFP	3.02	1.88*
ISTJ	3.52	2.21**
ISFJ	1.36	.94
INFJ	.33	.16

R^2 = .17 Significant at * 10%, ** 5%, *** 1%

ACT was the most significant of the variables, indicating that the student's ability is an important factor in determining success in macro. Gender, significant at the 5% level, is also an important factor. Since the dummy variable was one for male students, the negative sign indicates that the men in the sample did not learn as much as the women. Three personality types, ENFJ, ENFP, and ISTJ, were all significant with positive signs, indicating that these types may have an advantage in macroeconomics. Although not significant, the negative coefficient for TCH indicates that students with Professor #1, who is ESFJ, did not do as well as those with Professor #2, who is an ESTJ. This might indicate that students learn more if the teacher is more **T,** thinking, rather than **F**, feeling. The thinking teacher is probably less likely to sympathize with excuses for poor performance than is the feeling teacher. Students know that they must work harder, and therefore, they learn more. Also, Professor #1 taught the course in a summer terms, which are more

intense with less time to study between classes than the regular term when Professor #2 taught the course. The results for the micro sample are given in Table 4B below.

Table 4B
Regression of Personality, GPA, ACT, Gender, and Major on Micro DIFF

Variable	Coefficient	T-Statistic
MAJ	-0.50	-0.84
GPA	0.92	2.21**
ACT	-0.22	-0.19
GEN	-0.33	-0.56
ESTJ	-1.31	-1.09
ESFJ	-1.58	-1.31
ESFP	-1.46	-0.93
ENFP	-3.29	-2.33**
ISTJ	-.50	-.035
ISFJ	-2.37	-1.92**
INTJ	-1.61	-1.03
INFJ	3.65	2.25**

R^2 = .18 Significant at ** 5%

For the micro sample, MAJ, ACT, and GEN were not significant. GPA, the indicator of the student's work effort, however, was significant in micro. Of the personality types, ENFP, ISFJ, and INFJ were all significant. Their signs indicate that INFJ's performed better than ENFP's and ISFJ's in micro. Since all of the micro samples were taught by the same teacher, the TCH variable was not used in the micro regression.

CONCLUSIONS

In contrast with previous research, our results found that women improved significantly more than men between the pre-test and post-test TUCE in macro. Although the difference was not statistically significant, women's improvement in micro was larger than men's. With respect to personality type, it appears that students who are Extroverts perform better than Introverts in macro. In micro, however, the Introverts appear to perform better than the Extroverts. Borg and Shapiro found that Introverts performed better than Extroverts, but their research included only macro students. Teachers with thinking rather than feeling personalities seem to be better at motivating students to learn in macro.

In future research in this area, we plan to enlarge our sample until most of the personality types have at least thirty observations. We will include data from male teachers in order to determine if our women students did better because we are female teachers. Since 83% of all economics professors are male, the fact that we had no male teachers may have biased our results.

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EVALUATING MULTIMEDIA AS A MEDIUM OF DELIVERY FOR LARGE GROUP ECONOMICS INSTRUCTION

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ABSTRACT

While the use of multimedia in introductory economic education is growing, economic educators need to continue to research the its impact on student learning. There have been very few studies that have measured the impact of multimedia-based instruction on the academic performance of students and on student attitudes towards economics. This study reports results from classroom experiments where a multimedia-based approach in teaching introductory economics was compared to the traditional lecture-based instruction.

INTRODUCTION

Proper and increased use of current technology in the classroom may help generate more student interest in undergraduate courses. Bartlett and King (1990) noted that economics instruction has not kept up with the tremendous pace of technological growth in computer hardware and software. Other economic educators have become dissatisfied with the "chalk and talk" method of instruction (Becker, 1997; Becker & Watts, 1996). Today's technology allows users to combine full motion and still video, audio, computer graphics, and text. This is referred to as multimedia. Multimedia has been recognized as a major advancement in personal communications and has become a phrase that is widely mentioned in the world of computing, media, training and instruction. It is having, and will continue to have, a tremendous impact on education and learning. Educators are of the opinion that multimedia can inspire students by making learning exciting and relevant, thus helping to keep students' attention and encouraging them to stay on task for longer periods than conventional methods of teaching (i.e., lecture and text). Graphic representation of economic models provides students an excellent visual stimulus (Khandker & Wehrs, 1990). The ability of multimedia to offer this graphical representation could therefore make it a popular instructional tool.

Brodman (1993) identified three aims of multimedia: to engage the learner, to offer real-life simulations, and to keep the learner's interest while they learn. This is accomplished by providing students the opportunity to interact with the computer. Karstensson and Vedder (1974) stated that greater gains in economic understanding are likely to be generated in those classes where students acquire a greater interest in the subject. Motivating and stimulating the students allow us to create greater interest in economics with undergraduate students. The use of multiple media offers real-life simulations and may keep students from getting bored and improve their academic performance.

There is very little empirical data that demonstrates the effectiveness of multimedia as an instructional tool. Much of the evidence for its benefits was based on the personal beliefs of the users and other anecdotal evidence. This study attempted to investigate these claims. Therefore, this study attempts to determine whether a statistically significant difference in academic achievement and student attitudes results from the use of multimedia based instruction when compared to the traditional economics instruction (i.e., lecture and text) in an introductory college economics class.

RESEARCH QUESTIONS

Most anecdotal evidence and early empirical evidence has found multimedia to be effective in teaching and learning. Since there are different types of learning styles, multimedia offers students to choose one or more modalities of learning content. Today's students are accustomed to learning in new and innovative ways. Simulations and other forms of multimedia bring the real economic world into the classroom. Multimedia should therefore have some, negative or positive, effect on achievement and attitude. The three research questions are:

1.	Is there a significant difference between treatments over and above the student ability, math comfort, student attitude, expected grades, student learning and motivation strategies, and student's prior economic knowledge when predicting student academic achievement in economics?

2.	Is there a significant difference between treatments over and above student prior liking toward economics, gender, expected grades, self-efficacy, test anxiety, self-regulation, and the post-frustration of students toward economics in predicting student's post-liking toward economics?
3.	Is there a significant difference between treatments over and above student prior frustration toward economics, gender, expected grades, self-efficacy, test anxiety, self-regulation and the post-liking of students toward economics in predicting student's post-frustration toward economics?

METHOD

The study was conducted at The University of Akron with students enrolled in two sections of an introductory course in economics in spring 1996. The same instructor taught both sections of the course. One of the sections was randomly assigned to be the control group and the other the experimental group. The experimental group received lectures with the aid of multimedia-based presentations. The control group received lectures that used overhead transparencies. Both sections were taught on the same day. The control group had class in the morning and the experimental section had the class in the afternoon. There were 137 subjects in the experimental and 192 subjects in the control group.

Data was collected on a number of student characteristics. The results of the differences between the control group and the experimental group are shown in Table 1. As Table 1 shows, expected graded was the only variable with significant difference between the two groups.

Table 1
Mean and Standard Deviation of Pre-Experimental Variables

Variables		Control	Experimental	t
Prior Knowledge	M	0.56	0.54	- 1.60
	SD	0.12	0.11	

GPA	M	2.81	2.79	- 0.77
	SD	0.57	0.59	
Expected Grade	M	9.10	9.45	2.16*
	SD	1.99	1.88	
Prior Liking	M	4.37	4.44	0.25
	SD	1.31	1.27	
Prior Frustration	M	4.57	4.76	0.16
	SD	1.26	1.29	
Math Comfort	M	4.88	4.94	0.03
	SD	1.33	1.40	
Self Efficacy	M	4.84	4.87	0.03
	SD	1.08	1.13	
Cognitive self- regulation	M	4.64	4.75	1.87
	SD	0.84	0.80	
Rehearsal	M	4.46	4.40	- 1.28
	SD	1.12	1.07	
Elaboration	M	4.77	4.85	0.94
	SD	0.97	1.00	
Test Anxiety	M	4.18	4.13	- 1.84
	SD	1.32	1.54	

Note. n size - Control = 192, Experimental = 137; except Posttest (Control = 182, Experimental = 129); GPA (Control = 186). *Significant at .05 level .

MEASURES OF PERFORMANCE

Student Attitudes Towards Economics

Background information about the subjects was initially collected. This instrument gave the researcher information on the students' math and economics

background, attitudes about economics and their course load for the semester, etc. The questions used to measure the attitude of the students were adapted from one previously developed to measure attitudes toward statistics (Schau, Dauphinee & Veechio, 1993). The survey measures student attitudes (liking and frustration) toward economics.

Academic Achievement of Students

A pretest and posttest determined the knowledge of the students at the start and end of the experiment. A content analysis helped determine the content validity of the instrument. Three experts ascertained whether the questions on the instrument sufficiently tested the objectives of the course content.

Student Motivation and Learning Strategies

The third instrument, the Motivated Strategies for Learning Questionnaire (MSLQ), helped to collect and document student motivation and their learning strategies (Pintrich, Smith, Garcia, & McKeachie, 1991). The MSLQ is divided into two sections: motivation and learning strategies. The motivation section consisted of 31 items, which among other things assess the goals of the students in taking the class and their beliefs about whether they would succeed in the course. The learning strategy section consisted of 50 questions regarding the student's use of different cognitive and metacognitive strategies and student management of different learning resources.

Pintrich et al. (1991) found the predictive validity for the motivational scales to have significant correlations with the student's final grade. The same was true of the learning strategy scales, with the exception of rehearsal strategies and the use of peer learning and help-seeking. These correlations were recalculated with data collected from this sample.

The reliability of the instrument for the six motivational scales is measured by the internal consistencies (Cronbach's alpha) that range from .62 to .93. Internal consistencies (Cronbach's alpha) for the nine learning strategy scales range from .52 to .80. These alphas were recalculated for the data collected. Below is a discussion of the Cronbach alpha coefficients, which measure the internal consistency of the variable. The coefficients show that students in the study answered most of the questions consistently.

The self-efficacy variable, which measures the confidence of an individual in performing well in the economics class, had a coefficient alpha of .92 in comparison to the .93 that was found in the *Motivated Strategies for Learning Strategies Questionnaire Manual* (Pintrich et al., 1991). The variable was based on eight questions that were asked on the questionnaire. An example of a statement that

measures self-efficacy would be: "I believe I will receive an excellent grade in this class."

The other motivational variable, test anxiety, which relates to one's worry about performance on a test, had an alpha of .78 in comparison to the .80 listed in the MSLQ manual. A sample of a statement on the MSLQ that measures test anxiety is: "When I take a test, I think about how poorly I am doing compared with other students."

The learning strategy variables in the study were rehearsal, elaboration and metacognitive self-regulation. The coefficient alpha of rehearsal was .64 in this study and was .69 in the manual. One of the statements that measured this learning strategy was: "When I study for this class, I practice saying the material to myself over and over."

Elaboration had a coefficient alpha of .72 in comparison to the .76 in the manual. An example of a statement that measures elaboration would be: "When I read for this class, I pull together information from different sources, such as lectures, readings, and discussions."

The last learning strategy variable used in this study was metacognitive self-regulation. The coefficient alpha scores were very similar for this study (.78) in comparison to the manual (.79). An example of a statement that measured metacognitive self-regulation was: "I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for this course."

DATA ANALYSIS AND RESULTS

Regression models were used to test the hypothesis that Multimedia-based instruction has no impact on academic performance and attitude of students towards economics.

Academic Performance of Students

The effect on the posttest showed significance at the .05 a level, $\underline{F}$ (1,280) = 10.14, $\underline{p}$ = 0.13. The results (as shown in Table 2) show students in the experimental group did significantly better than those in the control group. However, the treatment the student received accounted for 3% of the variance in predicting posttest scores. The variable expected grade is significant. However, there seemed to be a difference in expected grades between the two treatment groups at the start of the treatment. The proportion of variance accounted for in predicting the posttest scores was small. (0.009).

Table 2
Summary of Regression Analysis for Variables
Predicting Posttest Scores (N = 291)

Variable	b	t	Probability Level	R^2
Prior Knowledge	0.37	5.10	0.01*	0.07
Section	0.05	3.14	0.02*	0.03
GPA	0.00	6.53	0.01*	0.12
Grade Expectations	0.00	1.63	0.05*	0.01
Post-Liking	0.01	2.80	0.01*	0.02
Post-Frustration	0.01	1.53	0.06	
Math Comfort	0.02	3.30	0.01*	0.03
Self Efficacy	0.00	0.80	0.34	
Cog. Self-regulation	- 0.01	- 1.28	0.19	
Rehearsal	0.00	0.23	0.99	
Elaboration	0.00	0.31	0.59	

Note. $R^2 = 0.48$. *$p < .05$.

Attitude (Liking) Towards Economics

The effect on the post-attitude showed significance at the .05 a level, F (1,320) = 10.79, p = 0.94. The results (Table 3) show the liking toward economics in both groups reduced, but it reduced more in the control group.

Table 3
Summary of Regression Analysis for Variables
Predicting Post-Liking Scores (N=328)

Variable	b	t	Probability Level	R^2
Prior-Liking	0.59	12.88	0.01*	0.33
Post-Frustration	0.22	4.94	0.01*	0.06

Section	0.33	3.14	0.01*	0.02
Gender	- 0.17	- 1.46	0.14	
Grade Expectations	- 0.07	- 2.36	0.01*	0.01
Self Efficacy	0.13	1.97	0.04*	0.01
Test Anxiety	- 0.01	- 0.40	0.68	
Cog. Self-regulation	0.10	1.33	0.18	

Note. $R^2 = 0.57$. *$p < .05$. An F test was used to analyze the data at a .05 Alpha level.

Attitude (Frustration) Towards Economics

The effect on the post frustration showed it was not significant at the .05 a level, F (1,320) = 0.25, p = 0.97. The results (Table 4) show the frustration toward economics in both groups decreased, but it decreased more in the control group.

IMPLICATIONS AND CONCLUSIONS

As discussed earlier, multimedia-based instruction was found to have a significant effect on student academic performance. However, the type of instruction accounted for only about 3% of the variance. The question that arises is whether multimedia is economically viable. Taking into consideration that using this method of instruction does involve high start-up costs, one needs to find out whether such an approach to instruction is worthwhile. It is our opinion that multimedia is indeed a viable option. One has to acknowledge the start-up costs on using such an approach are indeed very high in terms of equipment costs and time. But, once one gets past these costs, the advantages of multimedia do outweigh its disadvantages. Having course material in an electronic format would help in giving students access to class notes on-line. Instructors can make changes in their instruction at minimum cost. Albeit little, this study has shown that multimedia does indeed improve academic performance of students. Enhanced use of video, audio, and animation may further improve student academic performance. Researchers also have to reassess the use of traditional forms of assessment when innovative and new instructional tools are used. Becker (1997) concluded that standardized multiple-choice tests have not been successful in identifying differences in traditional learning environments. Katz and Becker (1999) suggested that researchers and economic educators look at other quantifiable measures to assess the impact of new technology on learning.

Table 4
Summary of Regression Analysis for Variables Predicting Post-Frustration Scores (N = 328)

Variable	b	t	Probability Level	R^2
Post-Liking	0.21	4.85	0.01*	0.06
Prior Frustration	0.54	10.07	0.01*	0.23
Gender	- 0.06	- 0.51	0.60	
Section	0.04	0.41	0.67	
Grade Expectations	- 0.03	- 0.97	0.32	
Self Efficacy	0.13	1.95	0.05*	0.01
Test Anxiety	- 0.10	- 2.31	0.02*	0.01
Cog. Self-reg.	0.00	1.07	0.99	

Note. $R^2 = 0.55$. *$p < .05$. An F test was used to analyze the data at a .05 Alpha level.

If students' liking toward economics diminishes less by taking an introductory course in economics that offers multimedia-based instruction, then it is likely that this will have an effect on enrollment numbers in higher level economics courses. This may also increase the number of students that pursue a degree in economics. Multimedia-based instruction could be used as a tool to attract students to economics.

There are implications for other courses taught in a way similar to that used as a sample in this study. There are many courses that have very high-class sizes and are required courses for all undergraduate students. Multimedia-based instruction for an introductory economics course is likely to have implications for other such courses in terms of student expectations. Once students are exposed to a multimedia-based approach to instruction, they may have similar expectations of other courses.

Electronic formats give students easy access to course materials. They can spend time in class trying to understand the material being taught, rather than writing notes or drawing graphs. This is especially useful for courses in economics where extensive use of graphs and diagrams confuse students.

Adaptation of new techniques such as multimedia can be used as an effective tool to fight teacher burnout. Teaching the same courses for many years can make

it difficult for instructors. Multimedia offers exciting avenues that will help avoid burnout.

Multimedia instruction can help increase the content of coursework. As mentioned earlier, electronic presentation formats allow for easy distribution of course materials. In traditional lecture-based courses, the instructor spends an inordinate amount of time waiting for students to copy graphs from the chalkboard or from transparencies. Electronic distribution would help instructors cover more course material in class and reduce the pressure of time on instructors.

Multimedia also has implications for faculty rewards. Solomon (1994) raised the question of whether innovative teaching practices such as multimedia-based instruction should count toward tenure and promotion. Acceptance of this notion may result in wider use of such innovative teaching techniques. Also, multimedia-based instruction is likely to affect teacher evaluations. Student evaluations could affect faculty remuneration, though the policy of study evaluations being criteria for faculty remuneration varies from department to department.

Implementation of multimedia-based instruction requires additional support staff. If done on a school-wide basis, faculty would need support for the maintenance and technical support of the hardware and software.

New and innovative methods of instruction such as multimedia can have implications on the way students learn and retrieve information. It can also help to connect prior knowledge with new information.

With the growth of multimedia and internet technologies in economic education, in our schools and universities, there is a need for continued research to study the impact of current technologies in economic education.

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ECONOMICS ARTICLES

DIVORCE UNDER QUANTITY CONSTRAINTS: WHAT CAN WE LEARN FROM THE FORMER SOVIET UNION?

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ABSTRACT

This study examines the determinants of divorce in the former Soviet Union using data on both standard demographic variables and also factors unique to both planned economies and times of economic disruption, such as rationing. A survey of 2793 former Soviet citizens who immigrated to the United States during the late 1970's and early 1980's is used for the investigation. Data on weekly workweek, income and conventional socioeconomic factors are combined with economic information appended by rationing (being subject to quantity constraints) to conduct the empirical investigation.

Findings of this study support the hypothesis that there is a positive relationship between women's weekly workweek and the divorce rate. Our results, however, do not support the prediction that the women's level of income is positively related to the divorce rate. Socioeconomic and demographic variables such as age, gender, number of children, education, and living space affect the divorce rate. Also, our result shows that the probability of divorce is lower among quantity constrained respondents as compared to those who are not; thus, the pressure of shortages bonds families together. This finding implies that relaxation of shortages should increase the divorce rate, ceteris paribus. Furthermore, the conclusion of this study is unique because its finding shows that macroeconomic policies that induce shortage would affect micro-decision making regarding divorce.

INTRODUCTION

This study examines the determinants of divorce in the former Soviet Union using data on both standard demographic variables and also factors unique to both planned economies and times of economic disruption, such as rationing. Conventional variables used are workweek, income, number of children, age, education, and living space. Additionally, we examine the effects of quantity

constraints (rationing) on the decision to divorce, using a cross-sectional survey of 2,793 former Soviet citizens taken during the last normal period of the centrally-planned economy.

It is essential to examine the determinants of divorce for the households living in the former Soviet Union to see if Soviet households are behaving differently in terms of their decision to get divorced compared to households in the capitalist countries. The findings of this paper and other microeconomics studies (e.g., Gregory & Collier, 1988; Collier & Mokhtari, 1989; Ofer & Vinokur, 1992; Mokhtari & Asgary, 1993; Mokhtari & Gregory, 1993; Asgary & Mokhtari, 1996; Mokhtari 1996; Asgary, Mokhtari & Gregory, 1997) that use western economic theories to investigate the behavior of households living in the socialist countries would provide useful information for demographers and policymakers. The conclusions of this paper may aid policymakers in evaluating *ex ante* the effectiveness of related policies in the current transition to a market economy. Furthermore, the findings of this study may provide some explanation regarding the influence of income and/or quantity constraints on divorce in capitalist societies.

There are more than three hundred studies on different aspects of divorce for the capitalist (developed, developing, and underdeveloped) countries (e. g., Willcox, 1981; Nation, 1981; Sander, 1985; Trent & South, 1989; Greenstein, 1990; McCrate, 1992; Peter, 1986, 1992, 1993; Finnie, 1995). A large number of these studies are from other areas of social science than economics. Most of the articles that used data for their analysis have used cross-sectional data. However, there are very few studies that investigate the same issue for the former Soviet Union (Chinn, 1977). According to our literature survey, there is no study on the determinants of divorce under the condition of quantity constraints for the former Soviet Union from the late 1970s to the early 1980s, the last relatively normal period before the economic transition began.

In the former Soviet Union, the overall divorce rate increased from 3.4 per 100 marriages in 1950 to 27 in 1971. In major cities of the Slavic and Baltic republics such as Moscow, Leningrad, Kiev, Regia, etc., the divorce rate has been higher than the overall average. Regia had the highest divorce rate in the country, 54 divorces per 100 marriages, in 1971 (Chinn, 1977).[1] Statistical reports of the industrialized countries show that more than half of all married women were in the labor-force by 1980 (United Nations, 1985). In the meantime, the divorce rate has increased significantly. Some studies (i.e., Chinn, 1977; Finnie, 1995) have shown that the government marriage/divorce policy has affected the divorce rate. Chinn (1977) stated that after the governmental reform of 1965 in the former Soviet Union, the number of divorces increased drastically.

There are some factors that have affected the divorce rate in the former Soviet Union, which may not be applicable to most of the capitalist countries. First, essential goods and services are subsidized, which may affect the short-term and

long-term financial cost of divorce (Chinn, 1977). Second, free education, low housing cost, and medical care lessen the opportunity cost of divorce. Third, the absence of capital markets (Asgary, Gregory & Mokhtari, 1997) would affect wealth accumulation and therefore divorce. Fourth, the existence of consumer goods shortages, black markets, and privileges may influence divorce rates.

LITERATURE SURVEY

Some economists (Becker, Landes & Michael, 1977; Becker, 1981) have argued that marriage is a contract between two partners in which both parties perceive they will be better off by marrying. The marriage partnership will continue as long as the benefit of staying married outweighs its cost. In the case that a marriage leads to divorce, a wife, a husband, or both parties reach to a conclusion that in the cost-benefit analysis, benefits fall shorter than the costs. There are many economic variables that influence cost/ benefit analysis. Researchers have found that women's labor-force participation, income, wage rate, number of children, urbanization, socioeconomic and demographic variables, and legal costs are the most important determinants of divorce. Cameron (1995) has done an in-depth review of literature on the econometric aspects of the determinants of divorce.

Some scholars (i.e., Willcox, 1981; Nation, 1981; Sander, 1985; Trent & South, 1989) found that there is a positive relationship between married women's income, employment, and divorce. They also found that employment and income make married women economically independent of their husbands; as a result, they will not tolerate unsatisfying relationships. Nation (1981) in a review of Willcox's work concluded that the real increase of women's independence due to new opportunities for self-support is one of the factors causing the increase of divorce in the United States. Trent and South (1989) stated that "Increase in economic opportunities for women provide the requisite independence for dissolving unhappy marriages." (p. 393).

Ross and Sawhill (1975) concluded that married women's income has two contradictory effects on divorce. First, the employment of wives reduces their economic dependence on their husbands, which in turn will increase the probability of divorce. Second, women's employment brings more income to the family's overall income, which may serve as an incentive for staying together.

Mott and Moore (1979) found no relationship between a woman's potential wage rate and the probability of divorce. In addition, they reported that direct economic factors (such as income) are less important as determinants of divorce than other socioeconomic and demographic variables (such as educational attainment, age, duration of marriage, and family history).[2] D'Amico (1983) concluded that there is a positive relationship between predicted wages and divorce for women aged

between 35 to 49. He suggested that women's expected income (permanent income), not current income, would lead to divorce.

Women's investment in human capital, such as education, work experience, and job training, will increase their productivity, which tends to increase their potential earnings and their standard of living. However, a large percentage of women work in lower-paying sectors of the economy as compared with men, and on the average, they earn 70% of what men receive for similar jobs. Some of the recent studies (i.e., Ofer & Vinokur, 1992; Mokhtari & Asgary, 1993) on the earning of the work force in the former Soviet Union have found that females earned 70% of what males did. Arendell (1987) reported that on the average married employed women contributed only 22% of the total family income during the mid 1980s in the United States. He stated that "Indeed, the total family incomes of most divorced women and their children is less than 50 percent of their family income prior to divorce" (p. 128). Low paying jobs mean relatively fewer benefits and often longer time to recover after divorce for women, especially if they have children, unless they remarry. As a result, employment is necessary, but not completely adequate, for women to become economically self-sufficient.

The results of the studies that examined the effects of number of hours of work on divorce are mixed. Some studies (Mott & Moore, 1979) found that there is no relationship between number of hours of work per week and probability of divorce, while others (Greene & Quester, 1982; Booth *et al.,* 1984) found that there is a positive correlation between the two. South and Spitze (1985), however, found that the number of hours of work was positively related to the probability of divorce only for women who worked at least thirty-five hours per week. Some of the studies (i.e., Becker *et al.,* 1978; Peters, 1986; Koo, 1989; Lillard & Waite, 1990; Ermisch, 1991; Starkey, 1991; Allen, 1992) concluded that having children as young as 2 years of age and as old as 18 years would effect divorce negatively, while others (i.e., Ross & Sawhill, 1975; Sawhill *et al.* 1975; Jensen & Smith, 1990) reported no impact of children on divorce.

Kawashima and Steiner (1960) examined the hypothesis that there is a positive correlation between industrialization, urbanization, and the divorce rate for urban Japanese. They found that from 1883 to 1943 the divorce rate actually decreased from 3.39 per thousand to .66 per thousand. They concluded that the urban divorce rate is not always higher than rural divorce rate for pre-war Japan. Other scholars (i.e., Nimkoff, 1955, 1965; Hareven, 1976; Ross & Sawhill, 1975; Lee, 1982; Peters, 1992; Allen, 1992) who studied the relationship between modernization, urbanization and family changes found that as modernization increases family disruption increases accordingly. Modernization in turns leads to urbanization and therefore, will reduce the role of the family unit as a necessity for survival, so the likelihood of divorce will increase. Of course, liberal family laws that are a bi-product of modernization have made it easier for women to get divorce.

There are some studies (i.e., Ferber & Sander, 1989; Allen, 1992) that concluded that there is a negative relationship between the legal cost of divorce and the divorce rate. The cost of divorce could be both monetary and non-monetary (social costs).

Peters (1993) discussed that both monetary and non-monetary factors are arguments in women's utility functions and showed that "the probability of divorce will be negatively related to the financial opportunity cost of divorce." (p. 71). She used NLS data and concluded that the short-term financial status of women would affect women's decision to divorce.[3] Finnie (1995) used data from the 1992 statistical of Canada and analyzed the status of the each family member after divorce. She found that after divorce the poverty rate for the "...lone-mother is well over double that of any other family type" (p. 115).

SIP DATA

This study uses data from the Soviet Interview Project (SIP) survey questionnaire. The SIP is a retrospective survey of 2,793 former Soviet citizens who left the former Soviet Union and immigrated to the United States during the late 1970s and early 1980s. SIP survey was conducted between April and December 1983. Respondents were stating the status of their life before they made any decision to leave the former Soviet Union. This database is a rich source of information and addresses questions such as economic, social, and political aspects of life in the former Soviet Union. There are questions related to marital status, education, occupation, age, number of children, labor force participation, income, wealth, etc. These questions referred to the late 1970s, which is the last normal period of respondent's life in the former Soviet Union.

Respondents came from medium to large cities in the former Soviet Union and possessed many characteristics in common with the current Soviet urban population. The means that the economic variables (e. g., household income, wealth, labor-force participation, marital status, etc.) of the respondents are comparable to those of the Soviet population (see Ofer & Pickersgill, 1980; Gregory & Kohlhase, 1988). Nevertheless, SIP respondents are relatively more educated than the referent population. This data set (SIP) has been analyzed by other researchers (see Anderson & Silver, 1987b; Swafford *et al.*, 1987; Millar, 1987; Gregory & Kohlhase, 1988; Gregory & Collier, 1988; Mokhtari & Gregory, 1993; Mokhtari & Asgary 1993; Asgary & Mokhtari, 1996; Mokhtari 1996; Asgary, Mokhtari & Gregory, 1997).

The number of useable observations for this study is 1,085 females. In response to the question of "What was respondent marital status in END-LNP [end of last normal period]?" 977 of the respondents stated that they are married and 108 are divorced. The rest of the sample consists of male, widowed, never married, remarried, separate, and extreme values, and therefore, they were dropped. Table 1 presents the overall descriptive statistics of the sample.

Table 1
Descriptive Statistics of the Sample (Females Married and Divorced)

Variables	M/V	SD
HW	41.17 (m/w)	15.92
Y	161.0(m/r)	127.0
WT	74966.7	230118.4
AGE	40.78(m/y)	12.75
EDL	14%	--
EDM	46%	--
EDH	40%	--
HH	3.47(m/p)	1.31
NC	1.47(m/p)	1.046
WH	16%	--
LS	37.60(m/sm)	29.53
RE	46%	--
QC	77%	--
NA	54%	--
PR	12%	

Table 1
Descriptive Statistics of the Sample (Females Married and Divorced)

HW:	hours of work per week;
Y:	monthly income;
WT:	total wealth;
AGE:	age of the respondent;
EDL:	continued education up to grade 8;
EDM:	earned high school diploma;
EDL:	cont. education beyond high school;
HH:	family size;
NC:	number of children;
WH:	had white-collar job;
LS:	square meter of living space;
RE:	residing is Moscow;
QC:	very dissatisfied with availability of goods=1, otherwise=0;
NA:	participated in the underground economy=1, otherwise=0;
PR:	had at least one of the following privileges: access to closed shops, access to closed clinics, use of an official car, or permission to travel to the West (=1, otherwise=0);
M/V:	mean/values;
SD:	standard deviation
m/w:	is the mean of the variable in hours of work per week;
m/r:	is the mean of the variable in rubles;
m/y:	is the mean of the variable in years;
m/p:	is the mean of the variable in persons;
m/sm:	is the mean of the variable in square meter;

Respondents were asked, "On the average, how many hours a week did you work at that job?" Table 2 shows that divorced women worked almost twice as much as married women. This variable is defined as weekly workweek (HW). Total monthly income (Y) is the sum of wages and salaries before deductions and from private income of the family at the end of the last normal period. Table 2 reveals that, on the average, divorced women work more hours per week, have higher earning and wealth, attained higher education levels, and that the majority of them reside in urban areas as compared to non-divorced. It is conceivable that divorced women are more educated and so they are economically more self-sufficient than non-divorced women.

Respondents were asked about their level of satisfaction with the availability of goods in the former Soviet Union. More than 75% of the respondents stated that they were "very dissatisfied" with the availability of goods. The remaining stated that either they are somewhat dissatisfied, somewhat satisfied or very satisfied. Very dissatisfied respondents are classified as quantity constrained (QC). Respondents were questioned, “About how much did (you/your family) spend on all goods and

services *Ana levo*".[4] About 54% of the respondents stated that they participated in the underground economy. The variable (NA) represents respondents who traded in the underground economy. Respondents were asked, "Did you have legal access to special shops?" The same question was asked about medical clinics, use of official cars, and permission to travel to the West. The respondents were classified as "privileged" (PR), if they reported receiving at least one of these perks.[5] Mean values of the data are presented in Tables 1 and 2.

Table 2
Descriptive Statistics of the Divorced and Married Women

	Divorced Women			Married Women		
Variables	M/V	SD	# Obs	M/V	SD	# Obs
HW	89.5(m/h)	21.16	54	40.1(m/h)	15.15	945
Y	170.38(m/r)	100.37	108	159.7(m/r)	129.6	975
WT	110099	278478.7	104	72348.5	224039.6	966
AGE	44.33(m/y)	12.9	108	40.4(m/y)	12.67	977
EDL	15%	---	16	14%	---	132
EDM	35%	---	37	47%	---	455
EDH	50%	---	54	39%	—	383
HH	2.42(m/p)	1.28	108	3.58(m/p)	---	977
NC	1.54(m/p)	.73	91	1.63(m/p)	1.07	903
WH	16%	---	16	16%	---	153
LS	31.92(m/sm)	15.21	100	40.6(m/sm)	30.60	926
RE	54%	---	58	45%	---	440
QC	76%	---	82	77%	---	754
NA	47%	---	51	55%	---	535
PR	10%	—	11	12%	---	117

Note: the definition of variables are the same as in Table 1.
Obs: number of non-zero observations;

MODEL

Construction of the model begins with equation (1), where weekly workweek and income are the independent variables and divorce (binary) is the dependent variable. In equation (2), socioeconomic and demographic factors are added as independent variables to equation (1).[6] In equation (3) quantity constraint (QC) variable is added as dummy variable to equation (2). The addition of QC variable enables us to investigate its effects on divorce. These three stages method have been performed to evaluate the effects of employment, earning, socioeconomic and demographic factors, and consumer goods shortages on marital dissolution. The model would be misspecified if the effects of quantity constraints variables were not examined. Consumer goods shortage have shown to affect households decision making process in many aspects (i.e., Mokhtari & Gregory, 1993; Asgary & Mokhtari, 1996; Mokhtari, 1996; Asgary, Mokhtari & Gregory, 1997).

The dependent variable is dichotomous (1, 0), where DIV=1 stands for divorced and DIV=0 stands for married.

$$DIV = \alpha + \beta\, HW + \beta_1\, Y \qquad (1)$$

$$DIV = \alpha + \beta\, HW + \beta_1\, Y + \beta_2\, NC + \beta_3\, AGE + \beta_4\, AGE2 + \beta_5\, ED + \beta_6\, LS \qquad (2)$$

$$DIV = \alpha + \beta\, HW + \beta_1\, Y + \beta_2\, NC + \beta_3\, AGE + \beta_4\, AGE2 + \beta_5\, ED + \beta_6\, LS + \beta_7\, QC \qquad (3)$$

where:

DIV	:	divorce=1, married=0;
HW	:	hours work per week;
Y	:	monthly income;
NC	:	number of children;
AGE	:	age of the respondent;
AGE2	:	age squared;
FED	:	continued education beyond high school=1, otherwise=0;
LS	:	square meter of living space;
QC	:	very dissatisfied with availability of goods=1, otherwise=0;

The independent variables are either quantitative, qualitative, or dummy variables, and are, except for quantity constraints (QC), assumed to be exogenous. QC variable is assumed to be endogenous because the pressure of shortages affects family stability.[7] Hence, unobservable factors that affect the family unit also affect the quantity constraint. To estimate the quantity constraint variable, which is endogenous, we utilize instrumental variable (IV) estimation techniques to estimate QC.[8] Since QC is a binary variable, we employ a logit model to estimate QC. The estimated maximum likelihood of QC has been substituted for the values of QC in

our empirical model. For the empirical estimation of the equations (1, 2, and 3) a logit model is employed and the method of maximum likelihood estimation technique is applied. The estimation results are reported in Table 3.

EMPIRICAL RESULTS

Table 3 shows that the estimated parameter for female weekly workweek (HW) is positive and statistically significant at 1% level for all three models.[9] This result demonstrates that as a female works more hours the likelihood of getting a divorce increases. This finding is in agreement with western studies (i.e., Willcox, 1981; Nation, 1981; Sander, 1985; Trent & South, 1989) that report a positive correlation between employment and divorce.[10] Moreover, this finding supports the idea of autonomy of wives and husbands as the critical factor in the relationship (i.e., Hill, 1988; Spitz & South, 1985). Our results, however, do not support the prediction that women's level of income (Y) is positively related to the divorce rate.[11]

Table 3, columns 3 and 4, reveals that as number of children increases the likelihood of divorce decreases. As the number of children increases, the opportunity cost of divorce increases for both parties; therefore, the likelihood of getting a divorce decreases, *ceteris paribus*. Moreover, divorce will limit access to the children by one partner, and thus reduces the expected value of that partner's investment, so there is less likely that partner would ask for a divorce, holding everything else constant. Also, having more children increases the cost of childbearing and rearing for women, more than for men (given that women get custody of the children) so there is less probability that women would ask for a divorce. This finding supports the concept of exchange theory in which the spouse examines the cost and benefit of divorce and reconciliation (i.e., Becker, *et al.*, 1979; Kitson, Holmes & Sussman, 1983; Peters, 1986; Morgan, 1988; Ermisch, 1991; Starkey, 1991 estimated). Table 3, column 3, shows that divorce is a nonlinear function of age. As the respondents get older, the likelihood of a getting divorce is less. This finding is consistent with studies (South & Spitze, 1986; cf. Balakrishnan, *et al.*, 1987; Thornton & Rodgers, 1987) that concluded that early marriage increases the likelihood of a divorce.[12] Our finding is in accord with Fergusson *et al.* (1984) and Thornton and Rodgers (1987) who described that "divorce is less likely when respondents age and marriage are older".[13]

The estimated parameter for education (ED) is statically significant and has the expected sign (Table 3, column 3). Holding everything else constant, the likelihood of getting divorced is higher for those respondents who continued education beyond high school. More educated women have higher earning power and are more aware of their opportunities in society and their ability to succeed.

Table 3
Dependent Variable: Divorced Female=1, Married Female=0

Intercept	-2.88[a]	-4.95[a]	-.93
	(.25)	(1.26)	(1.69)
HW	.015[a]	.016[a]	.015[a]
	(.005)	(.0056)	(0.058)
Y	-.00023	-.00012	-.00003
	(.00078)	(0.0009)	(0.0009)
NC	-----	-.79[a]	0.956[a]
		(0.17)	(.018)
AGE	-----	0.144[a]	0.13[a]
		(.062)	(0.06)
AGE2	-----	-0.0011[c]	-.001[c]
		(0.0006)	(.0007)
ED	-----	.38[c]	1.14[b]
		(.23)	(0.33)
LS	-----	-.032[a]	-.03[a]
		(0.0077)	(0.007)
QC	-----	----	-4.66[a]
			(1.32)
Log likelihood Ratios	8.95	73.67	86.16

HW : hours worked per week;
Y : monthly income;
NC : number children;
AGE : age of the respondent;
AGE2 : age squared;
ED : female continued education beyond high school=1, otherwise=0;
WH : had white-collar job=1, otherwise=0;
LS : square meters of living space;
QC : very dissatisfied with availability of goods=1, otherwise=0;
[a] : denotes significant at the 1% level;
[b] : denotes significant at the 5% level;
[c] : denotes significant at the 10% level;
( ) : figures in parentheses are standard errors;

The estimated parameter for living space (LS) is negative and statistically significant at 1% level. As the square meters of living space decreases the probability that a woman will ask for divorce increases, *ceteris paribus*. Greater living space provides higher utility for the family, especially for woman who uses

the space as a working space, so the likelihood of divorce is decreased.[14] This result may temper the effect of wealth on divorce.

Table 3, column 4, shows the estimated parameter for equation (3), where the quantity constraint (QC) is added to the equation (2), as an additional independent variable.[15] Column 4 reveals that the estimated parameters for HW, NC, AGE, AGE2, ED, and LS have the expected sign (similar to column 3) and are statistically significant. Since the results for these variables are consistent with the findings in column 3, the explanations are the same.

The estimated parameter for quantity constraints (QC) is negative and statistically significant at 1% level. This finding suggests that the probability of divorce is lower among quantity constrained respondents compared to those who are not. This indicates that the pressure of shortage bonds the families together. Holding everything else constant, increases in the level of shortages may lead to increases in the opportunity cost of getting a divorce, because each partner has to spend considerable amounts of time in acquiring goods.[16] This finding is unique because it is the first study to investigate the effect of shortages on divorce and to find that economic policies at the macro level (such as price controls, supply targets, etc.) would affect the micro decision-making process regarding divorce. Our finding shows that disequilibrium in the goods market would affect household decision-making. This is somewhat similar to great Depression in the United States.

The log likelihood ratio tests show that model (3) is a better predictor of the determinants of divorce as compared to the other two models (1 and 2). Thus, incorporation of the quantity constraints as an explanatory variable in the divorce model is required. This two step method (model 2 and 3) approach shows that the exclusion of the quantity constraints as a regressor (model 2) would lead to specification error.

Our finding for female labor-force participation, socioeconomic, and demographic factors is consistent with those of the western researchers. These results show that people living in both socialist and capitalist societies behave similarly in terms of decision-making regarding divorce. This conclusion suggests that women's decisions to get divorced is relatively more influenced by their individual well being. Holding everything else constant, in a centrally planned economy such as the former Soviet Union, macroeconomic policies that lead to shortages may effect the divorce rate.

CONCLUSIONS

This study has examined the determinants of divorce where there are quantity constraints. Our findings reveal that compared to non-divorced woman, divorced women work more hours per week, have higher earnings and wealth, attained higher educational levels, and that the majority of them reside in urban

areas, as compared to non-divorced women. It is conceivable that divorced women are more educated and so they are economically more self-sufficient than non-divorced women. Moreover, we can conclude that the determinants of divorce in the former Soviet Union depend on female weekly workweek, age, age squared, number of children, education, and square meters of living space.

Furthermore, our finding shows that those households that stated that they were subject to quantity constraints had less likelihood of getting a divorce than those who were not. Therefore, the probability of divorce is lower among quantity-constrained respondents as compared to those who were not. This suggests that the pressure of shortages bonds families together. Thus the relaxation of shortages in the current transition to a market economy should increase the divorce rate, *ceteris paribus*. The conclusions of this study are unique because the findings show that macroeconomic policies that induce shortages would affect microeconomic decision-making regarding divorce. Thus it is also possible that income constraints caused by recession or depression may also tend to reduce divorce rates, *ceteris paribus*.

ENDNOTES

1 Since the late 1940s, the labor-force participation rate of married women and incidence of divorce have been doubled in the industrialized countries (Australia, Great Britain, France, Germany, Sweden, United states, and former Soviet Union). Also, divorce rate has increased at a higher rate between 1965 and 1980 (United Nations 1985; Greenstein 1990). Finnie (1995) examined the divorce rate in Canada and stated that “In 1951, one couple divorced for every 24 marriages. In 1987, when marriage dipped and divorce peaked, there was one divorce for every two marriages, meaning that the ratio of divorce to marriages had changed by a factor of twelve.” (P. 111).

2 Hum and Choudhry used micro data (income) from Canadian households and examined the effect of income and work on marital dissolution. They concluded that it is “..the social roles expected of each partner and not merely the amount of money that the family has to spend that determine family stability,” (1992, p. 263).

3 Peters (1983, p.84-85) argued that "...women do take the financial consequences into consideration when making decisions about divorce. However, it is the short-term consequences that matter more".

4 The word *ana levo* is the Russian word for underground economy.

5 For an in depth discussion of this variable (QC) see Mokhtari and Asgary (1993), Mokhtari and Gregory (1993), Mokhtari (1996), and Asgary, Mokhtari, and Gregory (1997).

6 Respondents were asked "How satisfied were you with the availability of consumer goods in your town? About 77% of the respondents stated that they were very dissatisfy with availability of goods. The remaining 23% stated that either they were somewhat dissatisfy or somewhat/very satisfy.

7 For more discussion on the endogenity of QC see Mokhtari and Gregory (1993), Mokhtari (1996), and Asgary, Mokhtari, and Gregory (1997).

8 The instruments are income, weekly workweek, age, age squared, education, experience, number of children and their age, square meters of living space, and dummy variables for place of residency, satisfaction with the standard of living, occupation, and privilege.

9 We run similar regressions (equations 1-3) for married and divorced male respondents. Our empirical result shows that level of education, number of children, and quantity constraints are statistically significant and have the same sign as we found for female respondents. We find factors such as labor-force participation, living space, and age do not effect divorce rate for male respondents. It seems that factors that affect male respondents in asking for a divorce are less influenced by economics variables. This result may suggest that non-economic factors (such as preferences) cause men to ask for divorce.

10 Other studies (Chinn, 1977; D'Amico, 1983; Greenstein's 1990) found that marriages of women who work more than 40 hours per week and earn low income may lead to a higher probability of divorce, since women were not able to increase the family's wealth considerably and at the same time, they had to spend many hours away from home.

11 Low variation of income among Soviet women could be one possible explanation for the insignificant estimated parameter for income.

12 Other variables such as the duration of marriage for divorced women have been used as explanatory variables, but this information is not furnished in the SIP data.

13 Other variables such as the duration of marriage for divorced women have been used as explanatory variables, but this information is not furnished in the SIP data.

14 This finding is consistent with Peters (1993) conclusions who examined the effects of wealth on divorce. We also used place of residency (RE) as another independent variable in our model, but it was not statistically significant; therefore, it was dropped.

15 The interaction of QC with income and wealth were included as independent variables to capture the marginal effects of income and wealth on divorce, but the estimated parameters were not statistically significant, therefore, they were dropped. Also, we incorporated dummy variables for those respondents that participated in the under ground economy (NA) and privileged respondents (PR) but the estimated parameters were not statistically significant in either case, so we dropped them.

16 Ogburn and Nimkoff (1955) argued for two sets of variables that affect the probability of divorce desire (motivation) and opportunity (affordability).

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EUROPE VS. THE U.S.: AN ECONOMIC COMPARISON

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ABSTRACT

The most significant financial event of the last several decades is the establishment of the Euro as the single currency of 11 European countries. This is a giant step toward the creation of a much more integrated unit that was, at one time referred to as the United States of Europe. The U.S. and Europe, are of comparable size and population. It is instructional to determine Europe's competitive position relative to the U.S. in terms of how closely Europe resembles us, and how rapidly they are moving to become competitive across a spectrum of political, social and economic activities. Recent news demonstrates that in some areas they are moving rapidly to emulate us. In some areas they do not want to emulate us, and in other areas it will take a relatively long time to achieve comparability with the United States. The total picture then is one of Europe making great strides in efficiency within their union, but an area of the world that may never fully embrace the American social and business model. Their success in achieving economic superiority over the U.S. is going to depend largely on whether the European model is, over time, the better economic model.

INTRODUCTION

For several years the world has awaited the arrival of a single currency in Europe. That day, January 1, 2002, is fast approaching. That currency, the Euro, is often seen as an essential tool needed to allow Europe to compete head-to-head with the United States. Given that the U.S. and Europe are two of the most economically developed parts of the world, and are of comparable size, comparisons of the two regions to gauge just how equal they are should be instructive. How is the advent of a single currency directly or indirectly affecting Europe's regional differences, which differences are being addressed by other means, and what will be the overall significance of all the actions taken be to the achievement of true economic equality with the U.S?

HOW SIMILAR ARE EUROPE AND AMERICA

A recent *Wall Street Journal* article suggested that Europe is now where the U.S. was 15 years ago-- on the brink of a tremendous economic boom. The unspoken assumption was that Europe wants to be like the U.S. Another implication of the article was that, with the employment of a single currency, Europe and the U.S. are approaching a mirror-like identity. Both of these suggestions are incorrect, at least at present. With only a moment of reflection, we can appreciate that the division of the U.S. into states, and the division of Europe into countries represents two vastly different situations. European states are much more clearly divided by language, custom, history, war, law, sovereignty, etc. than America has ever been. Europe differs from the U.S. significantly in the degree to which they accept socialism as a desirable form of government. Custom and circumstance have led Europe to adopt business practices that do not have broad correlation to American business practices.

Despite the obvious differences between us, it is still useful consider the competitive advantages the U.S. enjoys because it is a single country using a single currency, governed by a single government. It is only a modest stretch to also say that, at least in the business or government sense, we are a homogeneous people. America is a single entity in a number of ways. At present Europe is a single entity only in the fact that they (soon will) share a single currency.

A major difference between the U.S. and Europe is in how each is governed. While the U.S. has slowly, almost stealthily, drifted into becoming a socialistic state, we lag far behind Europe in embracing the concept of socialism. From the standpoint of business, socialism tends to make the economy a lumbering giant. Mainly, this is because the government absorbs a greater percentage of the gross domestic product. Governments are not noted for the efficient use of assets. In addition, once it has committed assets to a particular cause, government is not very agile in re-directing those resources to better purposes.

The general effect, from a business perspective, is that businesses are less competitive because the government takes a larger percentage of their revenue. High taxes discourage entrepreneurs from taking risks. Consider that in America in recent years, start-up companies use generous stock options to attract talent for relatively low salaries. In France, however, the government takes two-thirds of any profit from options (Economist). This is one reason that starting a company takes more capital in Europe than it does in America. A less obvious result of high taxes is that there is higher unemployment in Europe, partly because the cost to employers of hiring are high. Adding to the problem, people are less willing to work because unemployment benefits are high. One might think that courageous politicians could resolve this problem: Cut Benefits.

WILL EUROPE CHANGE

Recently, I was talking to a former European student of mine who is now a director of a Swiss bank. In addressing the state of socialism in Europe, he made the following statement: "We (Europeans) think America is far behind Europe in providing for its people--especially in the area of health care. No one should be denied medicine or hospital treatment of any kind because he cannot pay for it. While it is possible that America will take a step away from socialism, Europe will never do so. There are two reason for this situation: One, we like our government benefits. Two, unlike Americans, when government tries to take benefits away, our people throw stones at the politicians." A European CEO expressed similar thoughts recently: "I believe that the capitalist world has been the best system invented by humanity to create wealth. But it is not necessarily the best system to distribute wealth and enhance the quality of life for humanity." (Fox, 2000)

The ex-student's perspective of given support by the fact that we elected Ronald Reagan in 1980. By this act we can imply some conscious intent to move toward less government and freer markets. Americans place a lot of reliance on individual responsibility, and acknowledge that such a system leaves some people behind. During the same period, and since, Europeans have typically elected socialists. Europeans see socialism as a path to modernization that avoids what they consider to be the insensitive worker dislocations. Socialism in has been referred to as "free markets with a human face", or as modernization with social responsibility. And, Germany has been quite successful in redistributing income so as to achieve a low level of poverty unknown in the U.S. (Fox) Other socialist nations, it might be said, have approached equality by lowering the standard of living of the upper economic classes.

HOW EUROPEAN GOVERNMENTS IMPEDE COMMERCE

Government hampers commerce in other ways. Europeans wanting to start a business face a discouraging morass of regulations that consume capital. Once in operation more regulations constrain the businessman from fulfilling his vision on how best to meet customer demands. In some cases, discounts or guarantees are banned, or the hours of operation are controlled (Fox).

European governments take an even more direct hand in influencing business. A KLM Royal Dutch Airlines venture with Alitalia was imperiled in May 2000 because it was suspected that the Italian government was giving privileged treatment at Italian airports (*WSJ 05-01-00*). The German government freezes capital by imposing a 50% capital gain in the profit from the sale of stock. The reverse

effect is expected when the German government ceases this practice in 2001. A perhaps more subtle, but more pervasive brake on European economies is a result of the interlocking interest of government in businesses and financial markets. Businesses that should be allowed to fail soak up capital as banks, at the direction of politicians, keep failing businesses afloat with scarce money. Alitalia, for instance was the beneficiary of an estimated $1.32 billion state bailout. Until the European Union imposed constraints on European banks as a pre-requisite to joining the Union, national banks routinely printed money at the direction of politicians who needed funds for a project, or to win an election. America is not without similar problems, but the level of government interference in the market is much less here than it is in Europe.

The English government similarly pumped $1.4 billion into the Rover automobile company only to see it floundering again. Prime Minister Blair's Labor Party is in a difficult position. They have stated their commitment to a market economy, but they also feel the union pressure to save the thousands of jobs that will probably be lost if BMW follows through on its April promise to break-up Rover, Not too long ago the government would have nationalized the firm to "save" it (Fox, 2000). Investing in firms that would otherwise fail is proving to be an unrewarding allocation of capital.

GOVERNMENT INFLUENCE IN COMMERCE

What is becoming increasing clear to European governments is their inability to influence economic events. To date, the Union has not been very successful in even stabilizing the value of the euro. Since the introduction of the euro in January 1999, it has lost about 25 percent of its value against the U.S. dollar. Foreigners may cheer because their European vacation money buys more. But, cheap money can also lead to inflation. The European Central Bank (ECB) employed the usual procedure to raise the value of their currency. It raised interest rates one-quarter point. The euro value continued its fall in value to $0.91 on May 2, 2000.

One train of logic puts the blame at the feet of government. The government wants low interest rates to help finance Europe's recovery from a stalled economy. The result has been a 2-point spread between European and American bonds that has money rushing, as one would expect, to the higher yield American Treasury bond. Hence, the falling value of the euro. Now Europe faces two unpalatable choices: Do nothing and live with a weak currency, or raise interest rates substantially and stall the economy. The European economy is easier to stall because it is more cumbersome than the U.S. economy due to its higher levels of taxes and government regulations (*WSJ, 05-02-00*). This is, then, another example of how socialism is incompatible with a free market model. One other problem plagues the ECB. The

public sees the ECB as being unpredictable. Although an examination of the ECB's actions leads to the conclusion that the ECB is more predictable than the U.S. Federal Reserve, the perception of unpredictability anticipates risk, which undermines the value of the currency (*WSJ* 05-02-00).

INTERNATIONAL COOPERATION

The stability of the euro is also at risk from the actions, or inaction, of other governments. The three major currencies could coordinate action to stabilize the relative values of all three major currencies, the yen, the U.S. dollar and the euro. The resulting stability would approximate the stability of having a single currency for the three markets--a circumstance that would eliminate currency risk between the markets, and that would allow capital to flow to its opportunities of highest yields. However, with Japan in recession, and the U.S. in an election year, neither is likely to put long-term currency stability ahead of its own short-term goals (*WSJ 05-02-00*).

Europe and America each have a single monetary policy for their geographic area. So one might say that, in this instance, Europe is at par with the U.S. The European Union also has strict rules on budgeting to avoid conflicts with the monetary policy, again putting it on a par with the U.S. Other policies, however, are decentralized to allow individual countries to address internal problems. This, in turn, allows countries to yield to unions on wage increases that are not tied to productivity. It also allows individual countries to unilaterally raise taxes. Such policies can alter the competitive positions of countries within the Union, actually threaten employment, and redirect capital away from the offending country. When taxes are raised in America, the change affects the whole geographic area, not solely the northeast or the southwest.

It is interesting that today we see the euro as a tool for achieving economic strength. However, initially, France's motivation for supporting a single currency was that it would more closely bind France to Germany, and hopefully prevent wars between them. Political supporters of the euro did not consider the single currency as a tool that would reduce government influence in the lives of its people, or in the economy.

THE AMERICAN VS. THE EUROPEAN BUSINESS MODEL

From an American perspective, European business is also hampered by a socialistic business model that has been called the corporate wealth model (CWM). The CWM model varies significantly from the market model, or shareholder wealth

model (SWM) widely used in the U.S. In the SWM, management works for the enrichment of the shareholder only. Workers are paid what they need to be paid to work, and the firm has no social responsibility to suppliers, or the community. Practitioners of the CWM tend to work for the betterment of their workers, their suppliers, and their community, as well as for the shareholders. The costs of this philanthropy has at least two results. First, the stockholder is denied part of the profits of production. This in turn depresses the price of the stock. One major company in America seems to have adopted this social model. Bank of America earmarks hundreds of millions of dollars for social causes.

One American firm long recognized for making business decisions with their eye on being a socially conscious entity is Ben & Jerry's Homemade Inc. The firm allocated 7.5% of its profit to worthy causes, kept the ratio of pay between the highest and lowest paid employee low, refused to use mild from hormone-treated cows, etc. Perhaps this business could have been successful operating in a more socialistic economy, but competitive stresses made the company uncompetitive in the long-run, leading the founders to sell out to a standard profit oriented firm. It is very instructive to see know that the ice-cream firm rejected the bid of a socially aware firm, and accepted the higher bid of Unilever (Brancaccio, 2000).

Under the CWM, a longer view of profits is common. It may be acceptable to sustain losses for several periods, if profits are probable in the long-run. Managers, under the CWM also do not feel the pressure from the stockholders because the one-share-one-vote rule, so prevalent in the U.S. is largely absent in Europe. Finally, the practice of unfriendly takeovers, so common in the U.S. was, until recently, considered rude in Europe. Again, this allowed for the mis-allocation of capital.

CHANGES IN EUROPE

However, Europe is moving our way. Laws are changing to free up capital by reducing the tax burden on profit, mergers are occurring with great regularity, and companies are issuing voting stock. In each case, the pressure to change, so as to more closely approach the SWM, has come from the great American economic success and growth over the last 15 years or so. Over time, European managers have been convinced that, among other things, the SWM is a better competitive model--even though they consider the necessary cost conscientiousness brutal.

Labor

Should Europe achieve tax and regulatory equality with the U.S. it still faces competitive pressures in other areas. For one, unions in Europe are much more

firmly entrenched than are the American unions. When benefits are threatened, they seem to neither care nor understand the need for their employers to be competitive. They are not above encouraging the stone throwing mentioned earlier. In April 2000, unions were blamed for the collapse of merger negotiations between a French a Canadian and a Swiss aluminum producer that would have reduced the cost of production of their combined output by $600 million (*WSJ 04-14-00*). In 1998, a German steel producer accepted a bid for one of its divisions. The successful German bidder bid $100 million less than did an Austrian bidder. But the lower bid avoided political and union hassles (Fox).

Again, it is instructive to look to America and appreciate that the American worker is free to go anywhere in the country to find a job. American labor is liquid. European law puts many roadblocks up for the worker who wants to move 100 mile to another country to find work. In addition there are restrictions on flexible work patterns such as part-time work. Rigid wage-setting structures also hold back business. The Confederation of British Industry is trying hard to influence the European Union to remove many of the barriers to economic growth (Taylor, 2000). However, even if all the legal obstacles to labor movement were removed, there would still be cultural barriers in place that would take a long period of time to overcome. Many European workers will not even consider crossing a border to find work Cultural and legal barriers impede the flow of workers across national barriers.

Cultural Differences

The existence of several cultures affects business in other direct ways. Europe represents a less homogeneous market than does the U.S. In most cases, an American one version of a product can sell everywhere in America. In Europe is it often necessary to alter the product to satisfy each culture. The problem is similar to the American altering of skin and hair products to attract black customers, but multiplied many times. Product distribution systems, and corporate presence tend to be much more localized than in the U.S.

Finally, Europe cannot easily overcome the complications of having several languages spoken in their market. Even within the relatively small confines of the European Central Bank, having to deal with 11 languages has posed some major communications problems. While most Europeans are multi-lingual, there are still language related complications in Europe that America does not have to deal with in its primary market. To a large extent, English is the international language of business. And, there is a move to make English, a variation of English, or an English-like language the official language of Europe. While this seems to make great economic sense, it is tough to see the French buying into this concept. In any case, world-wide English is going to be a long time coming.

CONCLUSION

In summary then, what seems to be the status of Europe vs. the United States? The first thing is that unless the U.S. moves to become more socialistic, the shareholder wealth model will always be a more profitable model than is the socialistic model. The shareholder model is more responsive to changing conditions simply because it has a single goal. It helps greatly that the U.S. government places fewer barriers to the movement of capital. While Europeans are moving towards the SWM we should not expect Europe to mirror the U.S. Europe's long history of socialism has left them unwilling to accept the harsher elements of our model. Having English as to main language across our American market will always provide us at least a small advantage. Having a single government is also an advantage for America, as is the liquidity of our workforce.

America has a vested interest in the success of Europe. For one thing, economic success may be a real deterrent to war. Economically, we know that a successful Europe provides America with a large potential customer base. Success of the euro could set the stage for a single currency world-wide. The probability of the European economy dominating the U.S. economy rests on developing their ability to surpass us in technology, and on the fact that the European market is somewhat larger than is the American market. However, the total American system seems to have a number of advantages over the total European system, that Europe will not overcome any time soon.

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IS IT TIME FOR A COMMON NAFTA CURRENCY?

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ABSTRACT

Should the NAFTA (North American Free Trade Agreement) nations adopt a common currency? Using the European Monetary Union (EMU) as a model, this paper seeks to address the feasibility of implementing a common currency in North America. A general evaluation of obstacles and rewards will be made, followed by an assessment of the need for a common currency. An assessment of the three NAFTA countries and the global advantages accruing to each will be discussed.

INTRODUCTION

A common currency is a form of money used universally by a group of political bodies (countries). It is designed to replace existing currency and is intended as a tool to level the economic playing field. The European Community has moved through the many stages of implementation of its common currency after years of negotiation and planning and controversy. The issues have revolved around the realizable advantages and more recently, methods of implementation. Since so much monetary autonomy is transferred from the individual countries to the community, there must be a consensus for economic policy. As a result, a fairly formidable political power has come into existence (Volcker, 1997). This paper seeks to explore the advantages and disadvantages of a common currency for the three countries that comprise the NAFTA. Studies have been done by Bayoumi (1997), Eichengreen (1994) and Masson (1997) regarding the comparable strengths of various economies needed to share a common currency. The concept of a common currency is not new. In 1961, Robert Mundell's theory of optimum currency areas suggests that a common currency is possible in the right regional environment with the right economic conditions. More recently, Eichengreen goes further; he suggests that not only is it possible but it may be inevitable (Eichengreen, 1997).

The decision to issue and use a common currency presents a multifaceted dilemma for any group of countries. The common currency affects not just economic issues but also social concerns and political events and decisions. The dilemma is particularly complicated for the NAFTA nations, (Mexico, the United States, and Canada) because there is a dramatic difference among their social, economic and political levels.

THE MODEL

Before contemplation of a common currency, the countries should be evaluated using Mundell's 'optimal currency area' as outlined in the *American Economic Review* (Mundell, 1961). The theory of optimum currency area examines the advantages and disadvantages of different regions adopting the same currency. Mundell notes that adopting a uniform currency has both advantages and costs, with the advantages stemming from the lower costs of changing money, and its greater value as a medium of exchange. He essentially simplifies common currency into two qualities, operating internally and externally. Externally, it is a regulator of exchange rates. Internally, it is a regulator of interest rates. Prior to addressing the technical details of issuance, implementation and function, a nation must carefully examine the short - and long-term rewards and benefits for its citizens that could result from a common currency. Most importantly, countries must recognize that a wide range of decisions currently made within one country would now be made by a group of countries. In fact, although each region considering the common currency will do so individually, an aggregate decision must be made to accept or reject.

If it is determined that a common currency is acceptable, necessary, and will benefit the countries involved, an implementation structure can be examined. These are the steps that the European Community took, leading up to the Maastricht Treaty of 1991.

As a model for common currency, the European Community can be compared to the NAFTA nations. Both enjoy working trade agreements that seek to facilitate inter-regional exchanges be they social, economic or political. One may assume that structural similarities in the individual trade agreements will behave similarly in practice. Therefore where similarities exist, one might conclude that a common currency could be utilized in the same way for both conglomerates. Where there are differences, one might expect enhanced effectiveness or ineffectiveness with a common currency.

COLLECTIVE EVALUATION

Returning to Mundell's theory of optimum currency, we examine the likely fit of the NAFTA nations with his criteria. A fit is directly related to the costs and benefits of adopting a common currency with costs being of initial concern. Areas that face similar economic disturbances will face low costs related to a common currency. Regions with dissimilar economic disturbances will face higher costs because their monetary policy responses will be different.

The combination of 12 countries into the European Monetary Union (EMU) may differ from the three NAFTA nations. For instance, France, Belgium, and Germany faced very similar economic situations making them likely candidates for Mundell's optimum currency. The common currency was seen as a means to facilitate economic assistance when economic disturbances did occur.

NAFTA does not enjoy the same economic parity. Canada and the United States have very similar strengths and would most likely encounter similar economic disturbances; this is not yet the case with their partner to the south. Mexico is financially weaker and has historically been in a position to encounter extreme economic disturbances. Therefore, the assistance required by Mexico as a part of a monetary union may create high costs for the other nations. In addition to the nature of underlying disturbances, three other broad considerations affect the costs of adopting a single currency. The efficiency of alternative mechanisms for using the exchange rate to alleviate economic disturbances is the first. The effectiveness of the exchange rate as a method of alleviating economic disturbances and finally the desired path for monetary policy can also vary regionally.

For the NAFTA nations, these questions can be restated. Based on history, it can be expected that Mexico is more likely to experience economic turbulence. What technique (beyond the fluctuation of exchange rates) do the U.S. and Canada have to assist Mexico in an economic disturbance?

It is also important to consider the regional path for monetary policy. This can cause conflict in establishment of policies for the common currency. When and if an economic disturbance occurs, what direction will be taken to rectify the situation? Are all regions contemplating similar growth or reduction plans? Will their responses be the same to each event? Again, it seems Canada and the U.S. might respond similarly but Mexico would not.

REWARDS AND LOSSES

In 1973, Einzig described a comprehensive list of pros and cons to the common currency in his book *The Eurodollar System*. These characteristics of common currency remain the same in the new millennium. In the examination of the list and its application to the NAFTA countries, one must determine the degree of

balance between positive and negative. The balance must be sufficient to outweigh the risk of the disadvantages as a result of an acute crisis (economic disturbance).

The common benefits and problems can be grouped into three general categories: physical, economic and functional. The physical process benefits include the simplification of all money matters. The amount of record keeping and calculations for losses and gains resulting from exchange rates would be significantly reduced as would the need for hedging against such losses and gains. The physical process problems are related to the actual implementation plans. During the gradual phase-in, the economic situation becomes fragile. This transition period can be very rocky which may cause a loss of political support for the common currency.

The economic benefits include international payments between neighboring countries, reduction of border tariffs, and joint efforts in mutual support by governments, as well as bargaining power with non-common currency nations. Economic problems are related to the use of monetary policy (tax rates, inflation, interest rates) as a stabilizing tool for the economy. Constraints on the ability of a government to use these tools may accelerate a precarious situation.

Functional benefits are generally related to the everyday use of the common currency. Key benefits include the ability of governments to freely support each other in minor economic disturbances. The expected lack of monetary fluctuation should also result in improved overall economic strength. From a functional standpoint there are nationalistic issues tied to protectionism. Currency has been strongly related to identity. Countries do not wish to be dependent on foreign suppliers for security reasons. Therefore, the replacement of an individual currency with a common currency creates a unique identity crisis.

INDIVIDUAL EVALUATION

Beyond the general examination of strengths and weakness of a common currency, each nation should evaluate its usefulness on an individual basis. The strengths and weaknesses of each nation vary markedly and it is quite likely that the benefits for one country may cause problems for another. The cultural differences combined with economic, social and political differences, can make alliances difficult, if not impossible. (Trevino, 1998).

Some argue that economic benefits are accrued only to members of an economic union and non-members accrue high levels of economic costs as a direct result of being outside. This serves to entice members into a currency union.

MEXICO

Mexico's economic history has followed the boom-bust cycle. Expansions have led to high trade deficits, inflation, and economic crises (Rovelo, 2001). In the past 20 years, Mexico has moved toward trade liberalization, privatization, and other market-oriented reforms. However, during these past two decades, Mexico has suffered through dramatically fluctuating economic performances (Kaufman, 1998). The over-borrowing and over-lending has tainted Mexico's track record. Events such as the devaluation of the peso made foreign investors less enthusiastic and borrowing difficult. The prospect of a common currency would, it seems, be tempting for Mexico.

A survey on attitudes towards NAFTA in Mexico in 1992 reported 75% of the respondents favored NAFA. Even with Mexico's economic downturn in 1994, a majority (55%) favored this agreement (Kaufman, 1998). But, small businesses have been unable to capitalize on this agreement due to the resources needed to compete globally. Conducting international market research and locating foreign buyers can prohibitively increase the production overhead (Case, 1999). Although Mexico's economy is performing well overall, the number of people living in poverty rose more than 40% in four years, from 1994-1998 (Leiken, 1998). This contrasts sharply with the fact that Mexico is currently the leading commercial power in Latin America (Cassidy, 1999).

THE UNITED STATES

The United States enjoys a position of economic strength. If the NAFTA nations were to consider a common currency the United States would be the dominant party. The growth in the other two countries though may be helping to close the gap. In March 2000, for the first time in history, Mexico received investment-grade status from an international ratings agency. Moody's raised its rating of Mexico's sovereign debt (Waters, 2000). Mexico's economy has continued to strengthen. By October 2000, it was reported that Mexico could cover 90% of its current account deficit without assistance from international creditors (Sissell, 2000). However, since the economic disturbances at this time are still likely unequal, the costs of an economic currency would be high.

There is political support for a common NAFTA currency. USA Today reported survey results indicating that 43% of Americans favor a NAFTA currency. This finding was surprising in light of the nationalistic identity expected from the power of the U.S. dollar.

CANADA

Canada is the single largest trading partner of the U.S. and the second-largest trading partner with Mexico. NAFTA's effect on Canadian companies has been positive, though not to the extent experienced in Mexico. Canada enjoys many of the economic freedoms that exist with a common currency. In fact, Blank and Haar suggest that Canada, Mexico, and the United States' economies are becoming one; that NAFTA simply reaffirmed an ongoing trend (Blank and Harr, 1998). In 1995 Canada was on the edge of a political upheaval. The potential for this sort of disbanding would have tremendous ramifications for a common currency. That aside, Canada has a heavy outstanding debt that would be assimilated with the American debt and the Mexican debt. Although it may not be monumental in and of itself, consideration must be given to the true amount of debt the NAFTA nations could handle with a common currency.

FINAL ASSESSMENT

It's been seven years since Eichengreen (1994) questioned why NAFTA did not need a common currency to support a fully-integrated marked if the EMU did. He answered his own question by responding that the tension caused in the U.S. by the peso exchange rate swings were negligible because of the small size of the Mexican economy relative to that of the U.S. economy. As long as this relative size remained constant, the problems caused by a change in the peso-dollar rate would be small compared to fluctuations experienced in Europe (Eichengreen, 1997).

He concluded the economic integration caused by NAFTA would remain limited for some time. This would be the result of NAFTA scheduling reductions of tariffs and barriers to foreign investments to be phased in gradually over the next ten to 15 years. He also concluded that the pressure for exchange rate stabilization would grow. (Eichengreen, 1997) Volcker (1997) in his speech *An American Perspective on EMU,* explains the desire of the European Community for close economic union and the logic of wanting to maintain exchange rate stability seems compelling. With floating exchange rates, large fluctuations of 20%-30% or more can be anticipated. With such fluctuations, a common market cannot become a true single market. Therefore, if an overriding exchange rate was decided upon to avoid the fluctuation, a common currency would become imperative.

Eichengreen (1997) claims there may be evidence that within NAFTA the shift from fixed to floating currencies has increased the volatility of exchange rates. However, there may be no practical alternative but to allow the currency rate to float subject to central bank management, in the hope that the market pressures do not imply exchange rate fluctuations on an intolerable order. However beyond some point, commercial integration without monetary integration may not be politically feasible (Eichengreen, 1997).

Using optimum currency area theory, diversified economies like those of the NAFTA can afford to continue floating against one another. However, the very different economic conditions that prevail in the three countries imply that significant compromise of domestic economic objectives would be entailed in any effort to stabilize exchange rates. With new presidents in both the U.S. and Mexico, the potential for this compromise now seems more possible. During George W. Bush's visit to Mexico in February 2001, President Bush discussed energy concerns with a broad statement. "What is important is to have a common policy whereby no one takes advantage of the other." During the Canadian Prime Minister Jean Chretien's visit to Washington, D.C., Bush asserted that a good foreign policy "is a vision that goes both north and south" (Roth, p. 17A).

The static analysis of gains and losses of a common currency indicates the pros to include reducing inflation and interest rates, thereby promoting economic stability. A common currency will reduce the risk of devaluation, which will in turn boost foreign investor confidence. A third benefit is the simplification of trade by eliminating the exchange rate transaction costs.

The loss from adopting a common currency includes the political loss of control over monetary policy. The economic loss would be in the elimination of the interest income from holding currency reserves. Additionally, the common currency adoption does not address the origin of economic crises and therefore cannot solve them (*Business Week*, 2000).

SUMMARY AND CONCLUSION

It is possible for a group of countries with relatively equal potential for economic disturbances to create a monetary union using a common currency. The countries must be willing and able to sacrifice monetary autonomy in return for gains in economic stability. Without common economic, social and political frameworks, a common currency will take longer to reap benefits and will certainly lose critical political support. With a common framework, benefits may be attained at a lower cost. There is evidence to suggest that economic integration through trade can create a more equal framework and lead inevitably to a common currency.

However, Mexico's economic and political systems are immature relative to the United States and Canada even with the substantial improvements over the past decade. Since Mexico's economic size is quite small relative to the United States, the shared need for a common currency is not yet realized. Eventually, pressure for a common currency will grow as the barriers to full commercial integration of NAFTA are eliminated and the globalization of the economy expands.

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ECONOMIC IMPACT ANALYSIS: THE CASE OF A HISTORICALLY BLACK UNIVERSITY

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ABSTRACT

The estimated Albany State University expenditure-output multiplier was 1.40. Total net expenditures associated with the University had an impact of $82,963,806 on Albany MSA economic output, $49,089,890 in value added (local earnings), and an employment impact of 1,746 full-time and part-time jobs in Albany MSA. Albany MSA industry mix was dominated by service industries and wholesale/retail businesses. All University expenditure sources had significant economic impacts on the major sectors of our local economy. Hence, Albany State University was intricately interwoven with these sectors of the local economy that sustain local economic well being. This study is a "snap-shot" analysis of economic contributions of Albany State University to Albany MSA economy in 1998/99 rather than a long-range outlook of the University's economic contributions. Also, the study did not account for the non-economic impact of the University, the University's economic impact beyond the Albany MSA, and the economic impact of the University's visitors during the study period.

INTRODUCTION

Non-profit organizations, including institutions of higher learning, often undertake economic impact studies as proxy for measuring their economic relevance in their locale and, in some cases, to justify public investments in their existence. Harik (1995) reported the economic impact of Western Michigan University (WMU) on Kalamazoo County, Michigan. In his study, Harik estimated the economic impact of WMU on employment, personal income and population of Kalamazoo County, Michigan as well as the rate of return on the State of Michigan's investment in Western Michigan University. Willis (1992) documented the impact of Virginia Commonwealth University (VCU) on Richmond Area, Virginia. Willis' work demonstrated all impacts of VCU, both economic and qualitative, on its community.

Willis' impact study, unlike most other impact studies, did not account for indirect and induced economic impact but accounted for direct economic impacts alone.

Garner and Holmes (1995) studied the economic impact of Tennessee-Tombigbee Waterway on its local economies and the United States economy in 1994. In their study, Garner and Holmes estimated direct, indirect and induced economic impacts of the waterway on economies of Alabama, Mississippi, Tennessee, Kentucky, and the United States. Also, Humphreys, et. al (1999) reported economic impact of the University of Georgia (UGA) on Athens Area in FY 1998. Humprey et. al. reported UGA's direct and indirect impact on Athens Area output, employment, and earnings. Two previous attempts were made to document economic impact of Albany State University (ASU), Albany, Georgia. Kooti (1993) and Brown (1997) estimated the economic impact of ASU on Albany economy in 1992 and 1994, respectively. Kooti and Brown reported direct economic impact of ASU expenditures on the Albany economy.

Other institutions of higher learning that recently conducted economic impact studies include Syracuse University, New York (Dickinson, 1999), Duke University, North Carolina (Rogoski, 1998), and Royals University College, East London, United Kingdom (Turner, 1997). In academic and non-academic (trade) journals, economic impact studies are often reported to justify private and/or public investments such as airport expansion (Sekhri, 1999), university research and development (Martin, 1998), stadiums (Baker, 1999), tourism (Rodriguez, 1999 and Fessenden, 1999) prisons construction (Hall, 1999), hospitals construction (Shepherd), etc.

The economic impacts of an institution of higher learning go beyond its locale. A university contributes to the local economy through technical assistance to local businesses and government and technology transfer resulting from faculty research. It also contributes to quality of life in providing cultural activities, sporting events, public lectures, volunteerism, charitable contributions, and in many other ways. This study seeks to determine the level of the fiscal impact of the University in Southwest Georgia in 1998/99 and to determine the nature of economic interrelationships between the university and the local businesses.

ECONOMIC IMPACT MODEL

The economic impacts of an economic unit is the response in a region's economic activities, such as output and employment, per unit dollars of final demand for goods and/or services of that economic unit to customers (households, businesses, and governments) outside the local economic region. Simply put, economic impacts of an establishment in a region are the net changes in the region's economic activities as a result of inflow of money from outside the region that are attributable to the existence of that establishment in the region. Therefore, all

expenditures in a region originating from outside the region constitute economic impacts in the region.

Economic impacts could be classified into three broad categories: direct effects, indirect effects, and induced effects. Direct effects represent the net change in economic activities (e.g., output or employment) as a result of a unit expenditure on final demand for goods and/or services of an industry or establishment. Indirect effects are net changes in economic activities resulting from interactions of all local industries, per unit value of final demand for goods and/or services of an industry or establishment. Induced effects represent the net change in economic activities resulting from expenditures of new household income generated by the direct and indirect effects, per unit value of final demand for goods and/or services of an industry or establishment. Both the indirect and induced effects constitute total effect of secondary, repetitive and continuous flow of spending and income on the local economy over a period of time. The cumulative effect of such secondary, repetitive and continuous flow of spending and income on the local economy over a period of time is technically known as the multiplier effect. The sum of the direct, indirect, and induced effects is the total impact effect, which represents the total net change in economic activities per unit value of final demand for goods and/or services of an economic unit.

The Multiplier Effect

The concept of multiplier effect is based on the notion that total impact of an initial exogenous spending (spending that originated outside the local economy) on the local economy is a multiple of that initial exogenous spending in the local economy. For instance, if an exogenous expenditure of $1 billion in a local economy results in a total economic impact of $4 billion on the local economy's output, then the initial exogenous spending of $1 billion has created an additional $3 billion in local economy's output. Therefore, the expenditure-output multiplier in that local economy is 3, i.e., each extra exogenous dollar spending creates an additional $3. The multiplier is the net change in economic activity (such as output) per additional unit of initial exogenous spending in the economy.

The concept of multiplier is based on the assumptions that the initial expenditure is usually associated with investment spending and the economy supports repetitive, continuous flow of expenditures and income (McConnell, et. al.). Thus an initial change in rate of spending will cause a spending chain with numerous successive steps of diminishing importance that accumulate to a multiple change in the level of output or employment. Generally, the greater the interaction of an industry within the local economy, the higher the multiplier of that industry or the higher the marginal propensity to consume locally (MPCL) by the households, the higher the multiplier for the local economy. Marginal propensity to consume locally

is the proportion of each extra exogenous dollar expenditure that is spent on locally produced goods and/or services.

Table 1 illustrates the concept of multiplier numerically. For a local economy, for instance, suppose the marginal propensity to consume locally is 0.75, the successive spending and incomes created as a result of an exogenous expenditure of $1 are shown in Table 1. Given that the MPCL = 0.75, each exogenous dollar spent in the local economy has a $1 direct impact on our local economy, initially, and it will create $0.75 in local income that will be available for further spending. In the second round of re-spending, the $0.75 additional local income has a direct impact on the local economy and it will create $0.56 in local income for further spending, etc. This repetitive, continuous flow of expenditures and income will continue until no additional income and expenditure can be created and the economy is said to be in equilibrium. At the new equilibrium, an extra dollar spent in the local economy would have resulted in a sum of $5.00 (additional $4.00) being created in the local economy with a total leakage (income spent outside the local economy though non-local taxes and non-local expenditures) of $1. In this case, the initial injection of $1.00 into the economy resulted in an extra $4.00 in local income/output, thus the spending-income (output) multiplier is 4. The concept of multiplier is applicable to other economic variables such as employment and each industry or sector of the economy has a unique multiplier of its own for an economic activity.

Table 1: Numerical Illustration of the Multiplier Concept

	Direct Impact	Income Created for Successive Spending Locally (MPCL = 0.75)	Leakage (Income Spent Non-Locally)
Initial Expenditure	**$1.00**	$0.75	$0.25
First Round of Re-Spending	$0.75	$0.56	$0.19
Second Round of Re-Spending	$0.56	$0.42	$0.12
Third Round of Re-Spending	$0.42	$0.32	$0.10
Fourth Round of Re-Spending	$0.32	$0.24	$0.08
Fifth Round of Re- Spending	$0.24	$0.18	$0.06
All other Rounds of Re-Spending	$1.71	$0.78	$0.20
Total	**$5.00**	**$4.00**	**$1.00**

DATA SOURCES

Data for this study were obtained from primary and secondary sources. Data on student, faculty and staff demographic and expenditures were obtained from student and faculty surveys conducted in Fall 1998. Additional information on faculty and students such as student enrollment and faculty and staff compensations were obtained from the Fiscal Affairs Office, the Registrar's Office and the Institutional Research and Planning Office. Albany MSA regional economic data were obtained from Minnesota IMPLAN Group, Inc. IMPLAN economic data contain multipliers for various economic spending levels (sectors) for specific counties in the United States. IMPLAN economic data are consistent with RIMS II regional multipliers calculated by the Bureau of Economic Analysis, United States Department of Commerce (Gazel, 1998).

EMPIRICAL RESULTS

The results obtained from this study were classified into three broad categories: economic impact of ASU student spending, economic impact of ASU faculty and staff spending, economic impact of ASU Operating Costs, and total output, value added, and employment impacts. This study does not include impacts of the University's visitors spending and the University spending on ASU reconstruction. The University expenditures on reconstruction were excluded because they were non-continuous but only to remedy unfortunate circumstances imposed on the University as a result of natural disasters – the floods of 1994 and 1998. The expenditures by the University's visitors were not accounted for primarily because of inadequate data. The omission of the visitors' expenditures will, therefore, cause an underestimation of the total economic impact of the University on Albany MSA.

(A) Economic Impact of Albany State University's Student Spending:

Albany State University's students spent about $14,289,942 in 1998/99, primarily on living expenses. Since students' sources of fund are from outside the Albany MSA, such as federal government grants, loans, etc. and because local resident-students could have spent their educational expenses at other Universities outside Albany MSA, student expenditures are, therefore, considered exogenous spending and they constitute direct economic impact on Albany MSA. Student tuition, health-care, and other University fees were not included to avoid double counting since these fees constituted income to the University that the University invariable spent in the local economy. The impact of such student expenditures was already accounted for elsewhere.

Table 2 shows the impact of Albany State University's student expenditures on the level of economic output in Albany MSA. In 1998/99, Albany State University's student expenditures generated a total output of $21,031,808. In Albany

MSA, Albany State University's student expenditures had greatest output impact on real estate, retail businesses, general merchandise and food stores, automotive dealers and service stations, restaurants, banking and insurance services, and commercial printing businesses. In addition, as Table 3 indicates, ASU student expenditures generated $13,079,298 in local income (value added).

Table 2: ASU Student Spending Impact on Albany MSA Output

Economic Sector	OUTPUT ($) Direct	Indirect	Induced	Total
Periodicals and Paper Products	362,834	75,112	29,940	467,886
Wholesale Trade	167,345	285,696	209,598	662,639
Real Estate	3,224,025	503,701	244,113	3,971,839
Petroleum Products	360,633	1,569	1,493	363,695
Hotels and Lodging Places	4,702	35,531	23,875	64,108
Amusement & Recreation Services	38,729	2	10,427	49,158
Government Services, including UPS	177,456	186,828	129,830	494,114
Commercial Printing	1,258,439	43,260	5,124	1,306,823
General Merchandise and Food Stores	1,792,117	15,278	188,298	1,995,693
Automotive Dealers and Service Stations	1,666,767	61,466	190,371	1,918,604
Restaurants	1,645,164	39,096	221,907	1,906,167
Miscellaneous Retail	1,016,031	8,662	106,754	1,131,447
Banking and Insurance Services	1,334,966	288,015	312,069	1,935,050
Other	1,240,734	1,571,904	1,951,947	4,764,585
Total	14,289,942	3,116,120	3,625,746	21,031,808

Table 3: ASU Student Spending Impact on Albany MSA Value Added

Economic Sector	VALUE ADDED ($) Direct	Indirect	Induced	Total

Periodicals and Paper Products	153,717	34,137	12,825	200,679
Wholesale Trade	114,889	196,142	143,897	454,928
Real Estate	2,234,877	349,163	169,218	2,753,258
Petroleum Products	166,609	725	690	168,024
Hotels and Lodging Places	2,432	18,375	12,347	33,154
Amusement & Recreation Services	17,237	1	4,641	21,879
Government Services, including UPS	59,242	97,419	56,462	213,123
Commercial Printing	211,266	15,663	1,892	228,821
General Merchandise and Food Stores	1,436,083	12,243	150,889	1,599,215
Automotive Dealers and Service Stations	1,032,749	13,833	126,673	1,173,255
Restaurants	788,392	18,735	106,342	913,469
Miscellaneous Retail	851,087	7,256	89,424	947,767
Banking and Insurance Services	916,551	186,902	200,153	1,303,606
Other	926,309	901,398	1,240,413	3,068,120
Total	8,911,440	1,851,992	2,315,866	13,079,298

Economic sectors in Albany MSA that experienced most significant income impact were the same as the economic sectors that student expenditures had greatest output impact upon, except commercial printing industry. ASU student expenditures' impact on commercial printing output in Albany MSA was $1,306,823 while its impact on commercial printing local income was low $228,821. Low income impact on commercial printing industry occurred because a high proportion of student spending on commercial printing did not constitute retained earning (income) in Albany MSA. Rather, most of the student spending on commercial printing leaked out of the Albany MSA to the regions where the major textbooks publishers were located. As Table 4 indicates, total student spending generated about 362 jobs in Albany MSA with greatest impact on general merchandise and food stores, restaurants, retail businesses, and real estate.

Table 4: ASU Student Spending Impact on Albany MSA Employment

Economic Sector	Total Employment (Number of Jobs*)
Periodicals and Paper Products	2.3

Wholesale Trade	7.6
Real Estate	25.8
Petroleum Products	1.0
Hotels and Lodging Places	1.4
Amusement & Recreation Services	2.7
Government Services, including UPS	3.4
Commercial Printing	8.4
General Merchandise and Food Stores	78.7
Automotive Dealers and Service Stations	31.0
Restaurants	59.0
Miscellaneous Retail	41.2
Banking and Insurance Services	14.6
Other	84.8
Total	361.9

*Full-time and part-time jobs.

(B) Economic Impact of Albany State University's Faculty and Staff Spending:

In 1998/99, Albany State University faculty and staff earned $24,691,530 in salaries, wages, and fringe benefits. Since not all earned income was received, faculty earned income and staff earned income were adjusted by factors of 0.70 and 0.85, respectively. Faculty members, including faculty/administrators, were assumed to pay an average of 30% income tax while the University staff was assumed to pay an average of 15% income tax.

ASU faculty and staff expenditures had output impact of $16,827,781 on Albany MSA (Table 5). Faculty and staff spending had greatest output impact on real estate, medical and health services, and banking and insurance services. Also, ASU faculty and staff expenditures created $10,740,653 in local income in Albany MSA, with the greatest impact on the same industries as output (Table 6). Albany State University's faculty and staff expenditures also had significant output and income impacts on wholesale/retail businesses, general merchandise and food stores, automotive dealers and service stations, and restaurants. In addition, Albany State

University's faculty and staff spending created 266 jobs in Albany MSA, with greatest employment impact on medical services, general merchandise and food stores, restaurants, wholesale/retail businesses, and banking and insurance services (Table 7).

Table 5: ASU Faculty and Staff Expenditures Impact on Albany MSA Output

Economic Sector	OUTPUT ($) Direct	Indirect	Induced	Total
		Indirect		
Maintenance & Repairs – Residential, etc.	-	316,224	76,177	392,401
Wholesale Trade	602,576	177,547	191,772	971,895
Real Estate	1,894,006	367,957	541,764	2,803,727
Communications	303,817	84,729	92,936	481,482
Educational Services	86,285	304	19,359	105,948
Medical and Health Services	2,123,383	24,529	522,095	2,670,007
Government Services, including UPS	356,154	136,539	118,788	611,481
Legal Services	175,272	69,797	63,910	308,979
General Merchandise and Food Stores	668,676	12,612	172,283	853,571
Automotive Dealers and Service Stations	646,674	48,048	174,180	868,902
Restaurants	764,146	28,987	203,034	996,167
Miscellaneous Retail	379,103	7,151	97,675	483,929
Banking and Insurance Services	818,506	283,580	285,527	1,387,613
Other	2,152,100	981,703	757,876	3,891,679
Total	10,970,698	2,539,707	3,317,376	16,827,781

Table 6: ASU Faculty and Staff Spending Impact on Albany MSA Value Added

Economic Sector	VALUE ADDED ($) Direct	Indirect	Induced	Total
Maintenance & Repairs – Residential, etc.	-	157,013	37,806	194,819
Wholesale Trade	413,691	121,893	131,659	667,243
Real Estate	1,442,488	255,066	407,346	2,104,900
Communications	194,594	54,182	59,430	308,206
Educational Services	38,123	129	8,540	46,792
Medical and Health Services	1,371,698	12,425	336,761	1,720,884
Government Services, including UPS	140,736	73,715	199,697	414,148
Legal Services	88,271	35,151	32,186	155,608
General Merchandise and Food Stores	535,832	10,107	138,056	683,995
Automotive Dealers and Service Stations	440,483	20,491	165,155	626,129
Restaurants	366,192	13,891	97,297	477,380
Miscellaneous Retail	317,559	5,989	81,818	405,366
Banking and Insurance Services	521,433	187,498	167,130	876,061
Other	1,238,410	564,691	256,021	2,059,122
Total	7,109,510	1,512,241	2,118,902	10,740,653

(C) Economic Impact of Albany State University's Operating Costs:

In 1998/99, Albany State University's total operating cost was $25,738,609. This level of direct spending in operating costs had a $54,104,217 impact on output in Albany MSA, with the greatest impact on economic output of the education sector (universities, colleges and schools) in Albany MSA (Table 8). In addition, significant output impact occurred in other sectors of Albany MSA economy such as facility maintenance and repairs, real estate, wholesale/ retail businesses, medical and health services, and banking and insurance services.

Table 7: ASU Faculty & Staff Spending Impact on Albany MSA Employment

Economic Sector	Total Employment (Number of Jobs*)
Maintenance & Repairs – Residential, etc.	5.4
Wholesale Trade	11.1
Real Estate	7.7
Communications	1.8
Educational Services	2.9
Medical and Health Services	38.9
Government Services, including UPS	4.3
Legal Services	3.8
General Merchandise and Food Stores	33.5
Automotive Dealers and Service Stations	14.6
Restaurants	30.8
Miscellaneous Retail	17.5
Banking and Insurance Services	12.8
Other	81.0
Total	266.1

*Full-time and part-time jobs.

Albany State University operating costs generated $25, 269,939 income in Albany MSA (Table 9). ASU operating costs had significant impact on income on the same economic sectors as output. In Albany MSA, a total of 1,118 jobs were attributed to Albany State University operating costs (Table 10). The greatest employment impact was recorded by the education sector (universities, colleges and schools) in Albany MSA. Other sectors of Albany MSA economy that experienced significant employment impact included maintenance and repairs, real estate, medical and health services, wholesale/retail services, general merchandise and food stores, restaurants, computer and data processing services, and banking and insurance.

Table 8: ASU Operating Costs Impact on Albany MSA Output

Economic Sector	Direct	OUTPUT ($) Indirect	Induced	Total
Facility Maintenance & Repairs	-	2,320,886	153,249	2,474,135
Wholesale Trade	-	422,127	637,418	1,059,545
Real Estate	-	1,708,594	742,380	2,450,974
Computer and Data Processing Services	-	722,780	38,349	761,129
Universities, Colleges and Schools	25,738,602	73	2,376	25,741,051
Medical and Health Services	-	2,052	1,735,355	1,737,407
Government Services, including UPS	-	246,787	394,831	641,618
Land Scape and Horticultural Services	-	37,051	113,121	150,172
General Merchandise and Food Stores	-	47,255	572,639	619,894
Automotive Dealers and Service Stations	-	33,486	405,796	439,282
Restaurants	-	42,507	674,850	717,357
Miscellaneous Retail	-	26,791	324,655	351,446
Banking and Insurance Services	-	327,586	949,045	1,276,631
Other	-	2,401,245	4,282,331	6,683,576
Total	25,738,602	8,339,220	11,026,395	45,104,217

Table 9: ASU Operating Costs Impact on Albany MSA Value Added

Economic Sector	Direct	VALUE ADDED ($) Indirect	Induced	Total
Facility Maintenance & Repairs	-	1,304,429	86,132	1,390,561
Wholesale Trade	-	289,807	437,612	727,419
Real Estate	-	1,184,388	514,614	1,699,002
Computer and Data Processing Services	-	383,006	20,321	403,327
Universities, Colleges and Schools	13,209,844	37	1,219	13,211,100
Medical and Health Services	-	1,321	1,119,338	1,120,659
Government Services, including UPS	-	131,712	171,708	303,420
Land Scape and Horticultural Services	-	32,618	99,428	132,046
General Merchandise and Food Stores	-	37,866	458,875	496,741
Automotive Dealers and Service Stations	-	25,403	307,839	333,242
Restaurants	-	20,370	323,400	343,770
Miscellaneous Retail	-	22,441	271,950	294,391
Banking and Insurance Services	-	191,331	608,692	800,023
Other	-	1,393,817	3,741,080	5,134,897
Total	13,209,844	5,017,225	7,042,870	25,269,939

Table 10: ASU Operating Costs Impact on Albany MSA Employment

Economic Sector	Total Employment (Number of Jobs*)
Facility Maintenance & Repairs	36.9
Wholesale Trade	12.1
Real Estate	15.9
Computer and Data Processing Services	10.3
Universities, Colleges and Schools	827.5
Medical and Health Services	25.2
Government Services, including UPS	5.1
Land Scape and Horticultural Services	6.4
General Merchandise and Food Stores	24.5
Automotive Dealers and Service Stations	8.7
Restaurants	22.2
Miscellaneous Retail	12.8
Banking and Insurance Services	11.7
Other	99.2
Total	1,118.5

*Full-time and part-time jobs.

(D) Total Output, Value Added (Earnings) and Employment Impacts:

In 1998/99 Albany State University's total spending in operating costs, faculty and staff salaries and fringe benefits was $50,430,139 and estimated total student expenditures was $14,395,140. After making the necessary adjustments for faculty and staff federal and state income taxes, Albany State University's total net injections into Albany MSA was $59,228,895, excluding the University visitors' spending and the University sending on campus reconstruction. Total net expenditures associated with the University had $82,963,806 impact on Albany MSA economic output (Table 11). Therefore, Albany State University's expenditure-output multiplier was 1.40, i.e., each dollar expenditure associated with the University generated an additional $1.40 of economic output in Albany MSA.

Among the sources of expenditures associated with the University, Albany State University's operating costs posted the largest output-expenditure multiplier of 1.75.

Table 11: ASU Total Output, Earnings, and Employment Impacts on Albany MSA

Expenditure	Output ($)	Value Added ($)	Employment (Number of Jobs*)
Student Expenditures	21,031,808	13,079,298	362
Faculty Expenditures	7,783,754	4,981,642	124
Staff Expenditures	9,044,027	5,759,011	142
ASU Operating Costs	45,104,217	25,269,939	1,118
Total	82,963,806	49,089,890	1,746

*Full-time and part-time jobs.

Similarly, total net expenditures associated with Albany State University resulted in $49,089,890 in value added or earnings in Albany MSA (Table 11), i.e., Albany State University's total net spending created $49.09 million income to local businesses and households in Albany MSA. Also, the University had an employment impact on Albany MSA with 1,746 full-time and part-time jobs. Considering the fact that the University employed 492 workers, Albany State University, therefore, created an additional 1,254 jobs in the local economy.

LIMITATIONS

Economic impact analyses are "snap-shot" analyses of economic contributions of an industry or establishment over a period of time. Therefore, this study is a reflection of Albany State University's economic contribution to Albany MSA in 1998/99 rather than a long-range outlook of the University's economic contributions. Also, the study did not account for the non-economic impact of the University such as contribution to quality of life in providing cultural activities, charitable contributions, volunteerism, etc. In addition, the study did not account for the University's economic impact beyond the Albany MSA. The study also ignored the economic impact of University visitors during the study period. All of the aforementioned limitations will lead to an underestimation of total impact of Albany

State University. Nevertheless, the study provided useful information on the economic impact of the University on the local economy in 1998/99.

CONCLUSIONS

This study indicated that Albany State University made a significant economic impact on Albany MSA economy in 1998/99. The University expenditures generated significant impact on Albany MSA output, employment, and value added or earnings (local income). Therefore, Albany State University is a great asset to Albany MSA as a result of its economic, educational, and other non-economic contributions to improve the quality of life locally and nationwide.

Albany MSA industry mix is dominated by service industries and wholesale/retail businesses. All University expenditure sources had significant economic impacts on the major sectors of our local economy. Hence, Albany State University was intricately interwoven with these sectors of our local economy that sustain our local economic well being.

This study provides a detailed study of economic impact of Albany State University on the local economy (Albany MSA). The methodology of the study was based on sound economic theory and defensible assumptions that made its results reasonable. Therefore, the underestimation of the economic impact of Albany State University as a result of the omitted University related expenditures is associated with an unknown but determinable probability.

This study has provided a good basis for further study of Albany State University that incorporates all expenditure sources and measurable non-economic impact as well.

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