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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 this issue 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 future editions of the *Journal for Economics and Economic Education Research* and encourage you to submit your manuscripts according to the guidelines found on the Allied Academies webpage at www.alliedacademies.org.

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ECONOMICS EDUCATION ARTICLES

DO ENTRY-LEVEL MATH SKILLS PREDICT SUCCESS IN PRINCIPLES OF ECONOMICS?

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ABSTRACT

Principles of economics relies on a rudimentary knowledge of mathematics, whether it is algebra or the use and understanding of graphs. The math skills that students bring into the principles course may greatly affect their eventual performance. In this paper, we show that outcomes on a math pre-test provide instructors with an early-warning signal of potential difficulty in principles of economics. Our statistical analysis indicates that, holding constant a variety of other factors, performance on the math pre-test and final grades are positively and significantly related. One implication of this result is that instructors armed with the results of the pre-test may be able to intervene, enhance at-risk students' math skills and improve student performance in principles of economics.

INTRODUCTION

Using mathematics to explain economics, while second nature to most instructors, often leaves students bewildered. And by mathematics we do not mean the specialized mathematical skills discussed in Becker (1998). Rather, we refer to a rudimentary understanding of algebra and arithmetic that are needed in a principles course to calculate index numbers, percentages and averages, and a fundamental grasp of graphs and charts that are predominant in principles of economics texts. To determine just how resources should be allocated to bring students' math skills up to a level that enhances success in a principles of economics class, it is essential to gauge the students' math skills early in the course. Few instructors assess their students' math capabilities before they delve into economic discussions that require some math knowledge. If a basic level of math skill is essential for understanding (and success in) principles of economics,

some front-end analysis may help alleviate student anxiety and lackluster performance in economics.

In this paper we assess the relationship between students' entry-level math skills and their performance in principles of economics. To gauge the student's basic math knowledge, we conduct a short pre-test is given in the first week of the semester. The results reported in this paper are based on data taken from several of our sections of principles taught at in the fall semester of 1997. Does a student's score in the math pretest provide a significant indicator of performance in principles of economics? Looking ahead, we find that, after holding a number of other factors constant, the answer to that question is yes.

DESCRIPTION OF THE EXPERIMENT

The experimental design is similar to the analyses of Evensky, et al. (1997), Anderson, Benjamin and Fuss (1994), Simkins and Allen (1997), and Dale and Crawford (2000), among others. (Siegfried and Walstad (1998) and Becker (1997) provide discussions of related studies.) In the Evensky study, for example, students in the introductory economics course at Syracuse University were given a 22-question quiz to assess their ability to interpret graphs. While graphical skills are important, so too is a basic knowledge of algebra and arithmetic. With that in mind, the math pretest we have constructed and use consists of 15 questions covering a broad range of math skills, including calculating the slope of an equation, determining a percentage change, plotting the relationship between two variables, and calculating an average. (A copy of the pretest is available on request.) This test is administered in class during the first week of the semester. Scores on this test are used to determine if performance on the math pretest, ceteris paribus, predict performance in principles of economics.

To determine the usefulness of the math pre-test score as an indicator of success in principles, a number of conditioning variables were collected for the statistical analysis. Previous work has found that the most important variable is the student's GPA. This measure serves as a portmanteau variable which captures the students' overall academic ability and, a priori, should be positively related to the final grade in principles of economics. Indeed, numerous studies have found that the GPA is the most important variable when included in a regression to explain student performance. Simkins and Allen (1997), for example, report that GPA is the dominant variable, eclipsing even SAT scores.

Siegfried and Walstad (1998) survey other studies that find the GPA to be significant.

TABLE 1
Student Characteristics (N = 271)

Characteristic	Percent of Sample
Age	
17-21	77
22-26	18
27-31	3
32+	2
Race	
Asian	4
Black	9
Hispanic	2
White	83
Other	2
Gender	
Female	40
Male	60
Hours Worked	
0	16
0<H<10	10
10<H<20	26
20<H<30	27
30<H<40	13
H>40	7
Living Arrangements	
Home	42
Campus	36
Off-campus, not home	21
Prior Math	
High School Algebra	21
College Math[1]	79
Prior Statistics	
Yes[2]	28
No	72
Prior Economics	
Yes[3]	27

	No	73
1	Includes college algebra and calculus.	
2	Includes business statistics or math statistics.	
3	Includes micro, macro or high school economics.	

A number of demographic variables also were collected to account for differences in living conditions--home versus on-campus--age, hours worked, etc. The data for these measures are based on responses to a questionnaire that was administered at the same time as the pretest. (A copy of the questionnaire is available on request.) The demographic variables used and the summary results of the questionnaire are reported in Table 1. Based on the responses to the questionnaire, the "average" student in our sample is a white male, aged 17-21, who works part-time, lives away from home, has had some college math, no statistics and no economics, prior to completing the test and the questionnaire.

To test the importance of scores on the math pretest as an indicator of success in principles of macroeconomics, we estimated the regression

$$(1) \quad FINAL_i = a_0 + b_1 MATH_i + b_2 GPA_i + c_{ij} TRAIT_{ij} + e_i$$

where FINAL represents the ith student's grade in the course (expressed as a percent of total possible points), MATH is the percentage correct on the pretest, GPA is the student's grade point average, and TRAIT is a catch-all variable that includes the j characteristics listed in Table 1. The terms a, b_i $(i=1,2)$ and c_{ij} are parameters to be estimated, and e is an error term. To account for the demographic characteristics, each trait is measured as a (0,1) variable depending on the response. We expect the signs on b_1 and b_2 to be positive.

In addition to the demographic characteristics included under TRAIT, an additional variable was used to capture any differential effects between instructors. This variable is labeled INSTRUCTOR. It is important to recognize that the INSTRUCTOR variable actually may reflect several factors at work. One is the fact that the instructors are of different gender. Another is that some instructors approach economics in a more math-intensive manner than others. Butler, et al. (1994), for example, found that whether math matters was a function of the instructor. This variable also may reflect institutional differences; for

instance, in our test one school is a liberal arts institution while the other is a more comprehensive university. It may be, therefore, that these commingled traits explain differences in estimated MATH coefficients. We address this issue below when we discuss the statistical results.

EMPIRICAL RESULTS

The data were obtained from sections of our principles of economics at Lindenwood University and at SIUE in the fall semester of 1997. Our sample, totaling 271 students, includes those students who took the math pretest and completed the course. Theoretically, selection bias caused by students dropping the course may affect the results. The small number of students included in this group--less than 10 percent of the total--and the fact the previous studies in which OLS results are compared with more sophisticated estimation techniques finds little difference suggests that the marginal return of not using OLS is minimal.

The results of estimating equation (1) are found in Table 2. It is worthwhile to briefly discuss the results for the TRAIT variables first, primarily because of the vast amount of previous work. For example, the results indicate that maturity (AGE) produces no statistically significant advantage. This outcome is similar to the findings reported by Siegfried and Fels (1979) and Dale and Crawford (2000). It differs from other analyses discussed in Siegfried and Walstad (1998) where older students are found to perform better than younger students. One explanation for this difference may be the fact that our age measure uses fairly wide ranges and may not be able to capture slight differences in effect from changes in age. (Combining age groups into broader ranges does not alter our finding.) We also find that gender does not account for any statistically different result in the final grade. It appears that ceteris paribus gender does not explain differences in final grades in principles. Finally, based on our sample, race, the number of hours worked and living conditions are not statistically related to performance.

The two trait measures that do achieve statistical significance are INSTRUCTOR and STATISTICS. As mentioned earlier the INSTRUCTOR variable may reflect a number of differences between the principals of this experiment. To test whether INSTRUCTOR accounts for the importance of MATH, equation (1) also was estimated with an interaction term between INSTRUCTOR and MATH to test whether there is any slope change. Specifically, the estimated coefficient on the interaction term is -0.06 with a

t-statistic of -0.99. The estimated coefficient on the MATH variable is unaffected. The results indicate that there is no such effect.

What is striking is that while STATISTICS is positively and significantly associated with a higher final grade, the same is not true for having had economics and college mathematics: for these two variables, neither is significantly related to the final grade in principles.

TABLE 2
REGRESSION RESULTS

Variable	Coefficient	t-Statistic
Constant	30.21	9.85
Math	0.15	5.44
GPA	10.29	11.96
INSTRUCTOR	6.55	3.97
AGE		
22-26	2.45	1.49
27-31	1.66	0.48
32+	-3.31	-0.81
RACE		
Asian	0.08	0.03
Black	-2.61	-1.20
Hispanic	3.69	0.78
Other	-2.93	-0.70
GENDER		
Male	-0.30	-0.25
WORK		
0-10	2.50	1.14
10-20	-1.61	-0.94
20-30	1.43	0.83
30-40	1.99	0.98
40+	-3.49	-1.53
LIVING ARRANGEMENTS		
On-campus	-1.16	-0.76
Off-campus, not home	1.21	0.77

PRIOR MATH	1.09	0.75
STATISTICS (yes)	3.10	2.32
ECONOMICS (yes)	0.96	0.82
N = 271 Adj-R^2 = 0.56 SEE = 9.03 F = 17.25		

The significance of STATISTICS may reflect the different skills taught in these courses. For example, statistics courses may provide a firmer foundation in the kind of reasoning that is useful in economics. The failure of prior economics to explain performance in principles, while disconcerting, actually is consistent with the Simkins and Allen (1997) and Dale and Crawford (2000) studies, both of which found that students did not retain basic economic skills.

Turning now to the variables of interest, the results indicate that the score on the math pretest (MATH) and the GPA are positively and significantly related to students' final grade in principles of economics. Specifically, we find that for every 1 grade-point level increase in the student's GPA there is an associated 10 percentage point increase in the student's final grade in the principles course. The result for GPA is consistent with expectations and most experiences: better students are likely to do better in class.

The results also indicate that the score on the math pretest is significantly related (t=5.44) to student performance in principles of economics. The estimated coefficient indicates that an increase in the math pretest score of 10 percentage points (effectively 1.5 questions) is associated with an increase in the final course grade of 1.5 percentage points. This finding suggests that the results from this pretest, administered early in the semester, can provide instructors with useful information regarding their students' math skills. More importantly, this information that may help isolate at-risk students who, without intervention, are likely do poorly in the course.

Several specification tests were conducted to determine the joint statistical significance of variables included in the regression. For example, using an F-test we were able to reject the hypothesis that the variables included under the heading TRAIT were jointly insignificant. The F-statistic from this test is 57.47, significant at the 1 percent level. Similarly, testing for the joint significance of the MATH and GPA variables yields an F-statistic of 187.94, also significant at the 1 percent level.

We also experimented with several alternative specifications to gauge the robustness of the results reported in Table 2. For example, since only the INSTRUCTOR and STATISTICS variables are individually significant at the 5 percent level, what would be the effect of omitting the other trait measures? We addressed that question using an F-test based on omitting the rest of the trait measures. This test yields an F- statistic of 24.67, which is significant at only the 10 percent level. This outcome suggests that a more parsimonious specification is one that includes only the trait variables INSTRUCTOR and STATISTICS. Equation (1) was re-estimated including only these two trait measures along with the math and GPA variables. The result of estimating this pared down specification is (t-statistics in parentheses):

(2) FINAL=30.81 + 0.17 MATH + 10.26 GPA + 6.44 INSTRUCTOR + 3.05 STATISTICS
(13.54) (6.50) (2.32) (4.29)
(2.37)

Adj-R2 = 0.55 SEE = 9.14 F = 82.56

Even in this more compact model, it remains true that the estimated coefficients on the math pretest score and GPA are positive and statistically significant.

CONCLUSIONS

Are a student's entry-level math skills an important indicator of performance in principles of economics? Based on a sample of 271 students, we find that after accounting for the demographic characteristics, GPA, and previous courses in economics, math and statistics, the answer is yes. The results reported in this study have several important implications for economics instructors. One is that we probably should pay more attention testing and enhancing our students' math skills. While there has been increased emphasis on learning-by-writing approaches to economics and other disciplines, our results suggest that pursuing this pedagogy in lieu of improving or reinforcing students' math skills may produce students who do poorer in principles of economics.

Another implication is that instructors have at their disposal a relatively low marginal cost process to identify students for whom a math review would be highly advantageous to their understanding of economics. By assessing students' math skills early in the course, the instructor has an early-warning signal of

potential at-risk students. This information allows instructors to intervene, to provide remedial math instruction or to alter the content of the course.

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TEACHING MICROECONOMICS: TIPS AND TECHNIQUES

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ABSTRACT

College of Business majors generally find the required microeconomics principles course to be difficult and abstract. In contrast, at Texas A&M University-Corpus Christi there is a more positive attitude toward microeconomics because the teaching style is not "chalk and talk," and there is emphasis on ownership of the course by business students and faculty. Students become "course owners" by participating in activities during the semester that include giving fast-feedback on guest speakers, videos, course material; preparing a notebook for each phase of the course; reporting on various research topics via Internet, that include the conditions of the labor market, through researching their own career interest. The business faculty also buy into ownership by challenging students not to be "turned off" by the microeconomics course and by expecting students to acquire skills that will be useful in their advanced business courses. With new teaching techniques practiced during the past four years, more than 80% of respondents to a microeconomics survey at A&M-CC agree that all students should be required to take an economics course in college.

INTRODUCTION

Approximately 1.5 million students enroll annually in introductory economics courses in the United States. Very few of this number intend to seek a career as an economist (Nasar, 1995). Almost all students who do major in economics are primarily interested in business as a career, not economics (Klamer and Colander, 1990). Students are not "drawn" to the area of economics as much as they are "pushed" because almost all schools of business require an introductory economics course. So it is with dread, fear, and trembling based on the perception that economics is too difficult and too abstract that most students wade through this required course.

When Texas A&M University -Corpus Christi (A&M-CC) made macroeconomics a part of its core curriculum, meaning that all full-time students would be required to take it, the economics faculty set out to change this attitude of fear students had for economics. They asked themselves three questions: 1. What do students need and expect from economics? 2. What do business faculty expect from principles of economics courses? 3. What teaching techniques can make economics principles more relevant? From surveys, trial and error, economic professors gained new insights and perspectives on how to make principles of economics more friendly.

STUDENT EXPECTATIONS

At A&M-CC, 80%-90% of students enrolled in microeconomics classes are majoring in some area of business administration. What students expect, other than making a passing grade, is to enjoy their economics course and to be able to relate economics to their major. After some initial revision of teaching methods, faculty began surveying students in 1997 to see how they felt about economics. Results are tabulated in the following table. The respondents were rather evenly divided among sophomores, juniors, and seniors. Although respondents were not random, they were from several different sections of microeconomics, and they were promised anonymity.

Microeconomics Students' Perception of Economics			
Questions and category of response	1997	1998	1999
How important do you think a general understanding of economics is in today's world?			
Very important or important	87%	85%	69%
Fairly important	11%	14%	25%
Do you feel that all students should be required to take an economics course in college?			
Strongly agree or agree	85%	89%	83%
Undecided	11%	6%	11%
Source: Surveys at Texas A&M University-Corpus Christi; Saunders, 1980			

Although none of the students were majoring in economics and concern for their major was their primary interest, their responses to the two questions in the table indicated that a high percentage of students thought economics was an important course for all students to study. It should be noted that the 1999 data was collected early in the semester, whereas in the two previous years the surveys were taken toward the end of the semester. Conclusions are that as students become active learners in the course, they become owners of the course and thus develop a more positive attitude about the importance of economics.

FACULTY EXPECTATIONS

Both business and economics faculty have similar expectations for the microeconomics course. Each expect that the micro course will equip students with skills and knowledge necessary to be successful in the upper-division business curriculum; i.e., students will acquire quantitative analysis skills and a good understanding of the market price system. To achieve these goals, professors of microeconomics expect to be able to turn students "on" to economics rather than "off." How can this be done?

TIPS AND TECHNIQUES

The following are tips and techniques that have proven, in our classes at A&M-CC, to lessen the apprehension students have for taking microeconomics.

Tip:	Professors need to teach the micro classes as if the students were non-majors rather than economics majors; i.e., students don't want to major in the subject but they want to understand how it relates to their world.
Technique:	"Linking" is an effective and motivating teaching tool. Linking economics from the theory and text to current actual examples in the business world is far more interesting to the student. Such linking has been accomplished in a number of ways by
♦	inviting outside speakers from local businesses to help connect course content to the business world;
♦	providing students an opportunity to view a Small Business 2000 video that is related to a current study topic and write a short paper for extra credit;

- providing students an opportunity to research their individual career choices after inviting the Director of Career Services to guest lecture and providing students an opportunity to do an optional credit Internet Career Search.

Tip: Create an interactive classroom environment; i.e., the more common"Chalk and Talk" method is a "no-no" (Becker & Watts).

Technique: Students become "course owners" when they have some active role in class activities.

- First, assume that each student wants to do well in the course and will try to build grade credit when given an opportunity. By using a sign-in sheet and offering two points credit on each major exam for perfect attendance during that exam phase, in addition to optional credit class quizzes, students can earn a letter grade of points going into a major exam.
- Second, emphasize that the student determines her or his grade, not the instructor. By giving students different opportunities for gaining extra credit, the student's confidence and connection to the relevance of economics are improved.
- Third, use quantitative analysis tips to help students learn how to relate curves, algebraic equations and tables of economic data such as demand and supply schedules. For most students this will be the first time they will understand slope, curves and algebraic equations.
- Finally, allow students to work with other students in class on economic cases or real world problems. For example, our classes determined the rate of growth of employment for different local economies. The local newspaper published this data in one of its articles. Another class, after watching the movie, "Other People's Money,"

divided themselves into outside and inside management. They then discussed, based on the stockholders meeting depicted in the movie, whether or not legislation should be passed to prevent the buy-out of a company by outsiders.

Tip: Develop and improve quantitative analysis skills early in the course so that later concepts can be understood.

Technique: Our micro course emphasizes the relation of schedules, graphs, and algebraic equations to one another. Because this emphasis comes early in the course, students are able to sketch graphs, determine slope, set up demand and supply schedules, and derive algebraic equations. The emphasis is on sketching graphs using critical values instead of plotting. They are then able to use these analytical skills to understand how buyers and sellers each benefit from using the market-exchange process for allocating goods and services. Understanding the relation of algebraic equations and graphs is particularly useful later in the course when studying foreign trade tariffs and taxes. Making decisions at the margin is also introduced early in the course. Once students understand that marginal simply means the change in total and can apply the concept to comparing marginal benefits and marginal costs, they begin to understand one of the most common and useful decision-making tools in business and economics. This understanding of marginal analysis is essential for appreciating how efficiency can be achieved in the allocation of scarce resources. A bonus for non-majors is that these quantitative skills transfer to other disciplines as well. Students build an important bank of knowledge to carry into future courses. They learn about consumer

	behavior, production theory, the relationship of total, marginal, and average costs and revenues, structure and performance of firms, and how people exchange locally and globally.

Tip:	Communicate with students.
Technique:	Simplifying language so the non-major can grasp the meaning should be the rule. Often those teaching economics tend to use economic terms that are meaningful only to other economists. For example, using the term "rents" to explain excess profits, or referring to isoquant curves and isocost curves to explain production problems may leave the undergraduate non-major baffled and not significantly better informed.

Using the fast-feedback technique as "ears" is another way to communicate. This technique involves asking students to write a note about how they are doing in the course, what they would like the professor to change or not to change, and what they would like to spend more time on in class. This keeps the student connected to the course, and it helps the professor to know what material may still need additional explanation.

Another fast-feedback technique is the use of optional credit quizzes. The quiz is presented at the beginning of the class and focuses on a question or problem from the topics scheduled for that class period. Participation is voluntary. The quiz is the starting topic for that day's material and sometimes students may volunteer to write part of the answer on the board in front of the class. To maintain communications it is important to have the papers graded and returned by the next scheduled class. Two points are given for a correct answer and -1 point for an incorrect answer. The accumulated points are added to each major exam grade. Gaining points before the major exam is an incentive for students to participate. The optional quiz has proven to encourage better class

preparation and also rewards students for arriving in class on time. The instructor benefits by gaining fast-feedback from students each time the class quizzes are graded. Good communication techniques help the teacher focus on the learning needs of the students.

CONCLUSION

At Texas A&M University-Corpus Christi we have attempted to change the process by which we teach in order to turn students "on" to microeconomics. The attempt has been to get away from the "chalk and talk" method and to make both students and business faculty "owners of the course." As we continue to refine our teaching techniques, we expect that students will become less apprehensive about taking economics. The feedback we are now getting from students in the form of class discussion, improved attendance, higher participation in optional credit projects such as class quizzes, Internet research, e-mail reports of videos, in addition to positive comments on end-of-semester course evaluations leads us to believe we are accomplishing this goal.

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TEACHING MANAGERIAL ECONOMICS WITH DYNAMIC COMPETITIVE SIMULATIONS: WARGAMING IN THE CLASSROOM

Shawn Carter, Jacksonville State University

ABSTRACT

All business firms face risks and uncertainties of various sorts in their day to day decision making. Drawing on military wargames to simulate battlefield conditions, business decision makers fabricate real world conditions so that managers must act and react to each other's actions. This paper illustrates how these simulations can be used effectively in teaching economics. Specifically, I develop wargaming exercises that center attention on the role of the entrepreneur in subjectively ascertaining and dealing with oligopolistic uncertainties to which his firm is subject. Since no one firm can perfectly anticipate either the actions of its rivals or how its rivals will react to actions by the firm under consideration, uncertainty is inherent in this market structure. In the classroom, the students are sensitized to anticipate and react expeditiously to market developments and to tailor solutions to authentic business problems. These simulations open the students' eyes to potential problems caused by competitive interaction and introduces them to a business decision practice commonly found today in the competitive market place.

INTRODUCTION

There has been a recent trend in economic education increasing the use of cooperative learning exercises to enhance student learning. Holt (1999) noted that placing students directly in an economic environment connects them to the theories presented in lecture. Beach (1997) concluded that students participating in or observing cooperative economic exercises score significantly higher than non participating "control groups" for the same course. These exercises enhance

learning because they open the students' eyes to enhanced understanding and retention of the theories presented in lecture.

Indeed, experimental methods are changing the way economics is taught. This trend has led to some economics textbooks replete with games and classroom experiments (e.g., Binmore 1992 and Gardner 1995). A popular introductory textbook by Mankiw (2001) includes an activity and game book written by Stull (2001). These experiments allow students to engage in classroom simulations that reinforce the theories presented in the course.

UNCERTAINTY IN BUSINESS DECISIONS

Oligopolistic behavioral uncertainty (Greenhut and Lane 1989) evolves from the condition that business decision makers face an increasingly complex market because of the rapid pace of technological innovations, the increased rate at which new products are introduced, intensified competition, market globalization, and more regulations. Business decision makers confront these challenges as they attempt to guide their companies through changing business landscapes.

The business climate is changing rapidly and firms need to be prepared for the dynamics required by anticipating and adapting to market risks. Entrepreneurs also have to be able to visualize the future needs of their consumers and to draft research and development plans which would meet future demands. Firms must acquire a strategy which recognizes that their profits and market shares depend on variables such as: customer satisfaction, employee satisfaction, inflation, interest rates, product quality, location, currency exchange rate volatility, taxes and economic growth.

In his 1994 book, Henry Mintzberg noted that "analysis intensive" business planning was destined to fail. Companies seek to efficiently produce and distribute their products. To accomplish this, typical "analysis planning" uses the past to interpret how the future might evolve. However, because markets are highly unpredictable and fast changing in this information age, it is impossible to predict how competitors will act based on historic analysis. Wargaming, on the other hand, addresses these dynamic issues by simulating the markets to be analyzed. Unlike "analysis planning" that uses historic information, wargaming is forward looking. Business executives are witnessing technological advances outpace strategic thinking, consequently, to improve their competitive rank in

oligopolistic markets, business executives have begun hiring consulting firms to create business wargame simulations.

Business wargaming simulations are designed and administered by many firms, including: MC Associates, Booze-Allen and Hamilton, Coopers & Lybrand, KPMG Peat Marwick, SAIC, Technology Stratigic Planning, Black and Veatch and Monitor Company. Evolving from military wargames, these simulations improve the understanding of business dynamics by allowing decision makers to discover how competitors are likely to react to their market actions. Wargaming exercises have been implemented by numerous industries including: utilities, airlines, oil, defense and electronics. Companies using simulations hope to train their managers to make optimal decisions to support the firm's mission. It is important to emphasize that in these oligopoly structures, the competitive outcome for each firm is dependent on their own actions and those of their competitors.

WARGAMING IN THE CLASSROOM

Sakar et. al. (1998) notes that oligopoly markets are traditionally taught using a two firm approach of non-cooperative behavior because mathematical solutions with more than two firms are too cumbersome for many students. The classroom use of game theory also has limited applicability to these business situations. Usually the dialogue consists of the classic games including "the prisoner's dilemma" and "the battle of the sexes." These classics are then transformed into a two company advertising or OPEC oil production game. However, with our complex multinational business society, the actions and reactions of oligopolistic competition is not as simple. Consequently, computer simulation games (i.e., TeleSim and Capstone) have been developed to create would-be worlds and allow students to divide into competing teams and play competitive simulations.

TeleSim, created by Coopers and Lybrand, is a highly recommended computer simulated wargaming program. However, this software loses some of the human element because the players act and react playing against the computer. Management Simulations, Inc. developed "capstone" business simulation software. Each team will play a series of decision strategies entered into the program. Instant feedback shows the results describing the competitive impacts of each teams actions. These simulations are very effective at introducing students to the complexities and consequences of business decisions. However, the programs are of limited value because they cannot contain strategy scenarios

that have never been thought of. A more dynamic classroom simulation will prepare students to consider the unexpected. Each team needs to include in their decision making "what ifs" to consider how their proposed strategy would fare against any potential action taken by competing teams. Any reasonable operation that a company could take in the real world should be fare game in classroom simulations. These actions will trigger reactions from other participants. Therefore, each team must think and act based on the strategies and expectations of strategies from other players.

Computer simulation games also limit student learning because they provide cookbook results to each potential set of actions. Student teams act and then wait to discover which team chose the best strategy. Consequently, team decision making is disconnected from the market consequences. A more dynamic simulation allows market teams to adjudicate the market response to the teams' actions. These market teams in effect synthesize the actions of the competitors to reveal the market results for each competitive period. A market team increases learning as competitive players seek to discover how their strategies and the actions of others impacted their profitability.

In the classroom, the instructor can teach about market interaction in oligopoly industries. With wargaming, the students become part of the interaction bringing together concepts, strategy, analysis and vision. Gapra et. al. (2000) developed a multi market oligopoly simulation with entry exit and pricing decisions. Teams deciding to enter are given the opportunity to select price and quantity. The authors use the simulation to encourage discussions about market structures. This approach, however, is limited because student participants are not free to act and react with any reasonable action. Their experimental design limits the strategies for participants.

DESIGNING THE SIMULATION

There are numerous consulting firms presently designing business simulations. The exercise presented here follows the basic design of the game developed by Booze-Allen & Hamilton for military and business wargaming. To design a dynamic classroom simulation the instructor must efficiently select teams. If there are twenty students in graduate managerial economics, I will select three company teams and one market team. Each team will have five members. I select teams based on a biographical sketch I request during the first class meeting, to include the courses they have completed and their employment

history. Because MBA students generally have a wide range of experience and skills, careful team selection is necessary to create equal teams. Consequently, I select teams in a way to give each group approximately the same amount of skills and experience. I should note that I will assign the students with the most business experience to the market team because their decisions are the most important, and it is paramount that the class trusts their judgement decisions.

After the teams are selected, I designate for each a company that they will represent. The players are required to explore the company's competitive landscape and collect company specific information. Specifically, each group is given three weeks to collect information about their company's finances, physical resources, and other performance variables found on annual reports. The teams also collect recently published articles about the company's standing. After collecting the information, each team shows a brief PowerPoint presentation about their company to the class and they provide me with a copy of their research.

By having the students collect and present most of the market information, they follow a path of self-discovery with a sense of ownership in their effort. This is more valuable than artificial scenarios created by software simulations. After the presentations, I create a packet including the information that each group provided. I also provide cost and demand functions for the industry, each firm's market value, and the costs that would apply to expansions. Due to limited resources, I invent demand and cost characteristics and present them in the packet as authentic market attributes. Each company team is provided a copy of the market packet. They will then meet outside of class to discuss their strategy. The basic objective of each is to choose actions that will generate the highest company profit given the competitive landscape.

COORDINATING THE WARGAME

During the team meetings, a recorder writes down every suggestion and counter suggestion until specific actions are agreed upon. Each group attempts to understand what incentives motivate the other groups and, consequently, the players can better anticipate what other teams will do in response to each action. Teams will tend to put themselves in other players shoes as they attempt to anticipate strategy reactions and to better understand the potential consequences. Groups sometimes play out their game with themselves simulating other teams before agreeing to their own best action. Generally, teams are not willing to share their strategies with other groups because they do not want to give away

strategic information. Interestingly, some teams will occasionally leak the wrong information to mislead their competition. This is similar to the misleading signals which companies can send in the real world. Any action that may be made legally in the real-world is acceptable in wargaming (i.e., these business teams can: enter new markets, invest in new technologies, counter a competitors aggressive move, cooperate with competitors, change production schedule, introduce products, announce takeovers, enter e-commerce, alter advertising, and vertically or horizontally integrate).

Each team must understand the move-countermove interactivity and the potential consequences of various strategies and actions. They must assess their competition and devise a strategy to match the amount of risk the team is willing to undertake. The players must also consider: salaries, taxes, debt, depreciation and regulatory concerns. Each simulation period represents two years in the market. During the exercise, the instructor is responsible to make sure all actions are feasible and acceptable. Teams are free to engage in any strategy that a firm could reasonably enact. However, the teams should be aware that some actions are not reasonable. Consequently, each team must contact the instructor prior to the simulation class to have their proposed actions approved. The teams are constrained only by the demand/cost limitations presented in their packet and legal/ethnical activities that I adjudicate on a case by case basis.

During a simulation exercise, each team shows a PowerPoint presentation explaining their market strategy. They also provide a copy of their presentation to the market team. Before the next class, the market team meets and adjudicates how each team's actions play out in the market. Specifically, they decide how much the market purchases from each team. In addition, they utilize the provided cost and demand information to calculate the profits earned by each team. The market team presents their results during the next class, which is the most crucial part because this is where the learning takes place. Afterwards, the teams will meet again outside of class to discuss their new market position and prepare their next strategy to be presented in the ensuing class. Generally, a complete wargaming exercise involves three to five simulations.

CONCLUSION

Wargaming allows students to research information, develop strategies and apply them. The actions are critiqued and the lessons are discovered. Students who participate in wargaming tell me that they believe the simulations

teach them more about "real world" business than other business classes they have completed. They also agree that the competitive nature of the exercises encourages them to work harder on the project. I should note that every wargaming exercise is different because of its dynamic style. Team strategies and actions will not be identical for each class. Consequently, the direction in which the market evolves is contingent upon what actions and reactions the teams choose.

Wargaming is a process of synthesized learning and amelioration involving creativity and insight. It requires the students to look at the entire market space and opens their eyes to the potential problems caused by competitive interactions. The students are sensitized to anticipate and react expeditiously to market developments and to tailor solutions to authentic business problems. They learn that links between products can create cascade effects where moves in one series can affect a firms profitability in other successions. Beyond the specific lessons learned about competitors and the market, wargaming also serves as a cogent avenue to foster teamwork and augment unanimity among participants about their group's ideals, strategies and tactics.

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ECONOMICS ARTICLES

AN ISSUE OF TENURE: SHOULD COLLEGES AND UNIVERSITIES FUNCTION AS A FOR-PROFIT BUSINESS?

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ABSTRACT

Tenure has been an issue of debate for over a century. It is a tradition that has been held in esteem for many years at some of the most prestigious institutions in the United States. In these rapidly changing economic times, it is necessary to review long-standing policies, and determine what course of action should be taken, if any. Though there are many opposing views concerning tenure and its abolition or continuation, the single issue they all revolve around is whether or not an academic institution should operate by the same standards and goals as a corporation. The conclusion is no, but colleges and universities can make positive changes to provide for better efficiency and consumer satisfaction.

INTRODUCTION

Tenure has come under attack because in the age of corporate downsizing, corporate leaders, legislatures, and some board of trustee members have questioned why colleges and universities should not also be made "leaner and meaner" (DeGeorge, 1997). In order to address the issue of whether an institution of higher learning should operate as corporations do, one must define the role academia takes in society compared to the role a corporation takes in society. Secondly, one must define tenure and its purposes, including arguments for and against this long standing tradition, and finally conclude, weighing both sides equally, what course of action should be taken to remedy the problems facing tenure.

Comparing the corporate and academic cultures is like comparing apples and oranges. Their motives are strikingly different, as well as organizational structure, specialization, decision-making process, and hierarchy of power. Each could learn valuable lessons from the other, such as the presence of shared

governance in higher education as a decision-making tool. Corporations would benefit greatly in the area of labor relations if similar policies were adopted. Colleges and universities could provide a great service to their consumers, that is students, if like corporations, they would place greater value on the student's needs, and not their own sense of what is necessary for a proper education.

Tenure is defined many ways, but for the purposes of this research, it will be defined as relating to faculty at colleges and universities, and as the American Association of University Professors (AAUP) defines it:

> "After the expiration of a probationary period, teachers or investigators should have permanent or continuous employment, and their service should be terminated only for adequate cause, except in case of retirement for age, or under extraordinary circumstances, such as financial exigencies" (DeGeorge, 1997).

Tenure has traditionally been held as the watchdog of academic freedom. There are many factors, which keep tenure in place, according to Mortimer (1985):

1. The pervasiveness of tenure systems among colleges and universities, which discourages deviation from the accepted practice.
2. The resilience of the principle of tenure, academic freedom, and economic security against attack.
3. The legality of seniority, and
4. Support for tenure systems by faculty unions (Mortimer, 1985)

According to Richardson (1999), tenured and tenure track faculty now constitute only 35 percent of all of those who teach at institutions of higher learning. This is good news for critics of tenure, because not too many decades ago, almost all faculty were tenured or on the tenure track (Richardson, 1999). There are many critics of tenure, but few distinct criticisms. Most fall under the

economic umbrella, citing decreases in productivity and motivational problems with post-tenure professors.

The purpose of this study is to strike a balance between opposing sides of the tenure debate. In a free market economy, such as exists in the United States, the organizational model of the academic institution can thrive, and continue to grow. It is necessary for attitudes to change, such as acceptance of the institution that chooses not to offer tenure, or combine it with part-time faculty, and/or multi year contracts. Institutions of higher learning should be able to adjust to the changing economic environment effectively, without dismantling the long-standing traditions put in place decades and centuries ago. Tenure is an economically sound policy for colleges and universities, but should not be so sacred, that it cannot be reformed.

COMPARING THE ACADEMY AND THE CORPORATION

According to DeGeorge (1997), colleges and universities should not be compared to businesses, and the education of students should not be compared to products produced by factories. Businesses usually benefit from downsizing, whereas a college or university may not become more efficiently valuable. In fact, the opposite is more likely to occur. Corporations are managed hierarchically, whereas a college or university is not. Chief Executive Officers may make decisions with or without board approval, but administrators share decisions with faculty members. Finally, business is subject to changing trends, whereas most colleges and universities will not find themselves with faculty expertise that is outdated (DeGeorge, 1997). Morrell (1994) points out that the private sector employee can expect five to six promotions and the possibility of profit sharing. Faculty members can expect no more than two promotions, with no possibility of profit sharing (Morrell, 1994). Because many members of the board of trustees are from the business world, faculty members may be seen, not as partners in the academic enterprise, but as mere employees (Perley, 1998).

MODELS

DeGeorge (1997) sets up five models of a university. The traditional model goes back to the 13th century and the University of Paris. This university operated autonomously and was faculty run. Students would learn from the master, and the university was not subject to local authorities. The second model

is student-run. The main purpose was for job preparation. Students hired faculty specializing in law or medicine, for example, to teach them what they needed to know to thrive in that profession. The third model is similar to what existed in the former Soviet Union. Faculty could only teach the state's ideology, and students were prepared for specific jobs. The fourth model is an entrepreneurial one. Its goal is to make a profit. Someone starts a college or university, hires faculty and staff, and pays them to teach the students. Courses are determined by the greatest demand. The fifth and final model DeGeorge (1997) presents is the state college or university, and is a mixture of the previous models. It has some autonomy, even though it is supported by tax dollars (the state) and students, by way of tuition. The faculty decide what should be taught and how is should be presented (DeGeorge, 1997).

McPherson (1983) contrasts academic institutions and corporations using tenure, structural aspects, knowledge capital, training patterns, job security, and motivation. Academic tenure differs from the job protection seniority provides to productions workers. A striking contrast between academic institutions and corporations is the nature of the job guarantee. In a college or university, there are a number of high-level employees who do not expect to stay. Tenured faculty are not only assured continued employment, but continued employment in a highly specific and well defined area, such as 18th century French literature (McPherson, 1983). McPherson (1983) contends that tenure has some desirable efficiency properties that are often overlooked.

Corporate employees are hired with a lifetime guarantee following a brief probationary period. Barring malfeasance or economic hardship, they will retain continuous employment. They are not, however, guaranteed a specific assignment; instead they face a variety of career paths. University employees do not receive an immediate employment guarantee, but face an extended probationary period. When they are guaranteed employment, it is for a specific set of tasks with well defined prerequisites (McPherson, 1983).

ACADEMIC EMPLOYMENT

In academic employment, there is very little internal job mobility. It is well understood that people who are hired as faculty either stay on as faculty or are dismissed. Very few former faculty members move on to administration, and non-faculty members are rarely promoted to faculty. The college or university lacks the flexibility to assign responsibilities to workers (McPherson, 1983).

When a worker is inflexibly attached to a particular job, McPherson (1983) states that mismatches between wage and productivity can only be avoided by (a) adjusting wages to match individual productivity, (b) accepting the costs of higher turnover by dismissing low productivity employees, or (c) introducing more intensive and costly initial screening. Alternative (c) has been the chosen method for academic employers. It is more intense than that which corporations undertake (McPherson, 1983). Corporate employers have the ability to make marginal adjustments in job assignments, which increases productivity in the labor force. In the university, monitoring performance is of little value. One way to increase productivity is to use information about tenured faculty to increase or decrease wage rates and serve as moral suasion (McPherson, 1983).

The major structural contrast between academic institutions and corporations is the fact that individuals are hired to do narrowly defined and rigidly specified jobs in the college or university (McPherson, 1983). Another important difference, McPherson (1983) states, is the difference between the knowledge capital workers require to do their jobs. In a university the knowledge is specific to the occupation and not to the firm. In the corporation firm specific knowledge, such as codes, practices, and procedures are important (McPherson, 1983).

Training patterns differ from university and from corporate work. According to McPherson (1983), academic employment is for a specific academic discipline, and is an example of an extreme case of "non-appropriability" of worker training. The university hires its employees already trained, at someone else's expense. Faculty's duties remain constant, and hopefully improve with time (McPherson, 1983). The corporation hires generalists, who are put through firm-specific training, and future periodic training in firm related skills (McPherson, 1983).

The form of agreement of job security differs in academic institutions and corporations. The university has little authority to reassign workers to different work. The faculty member has the authority to determine his/her job description. This is what attracts many people to academic employment, the freedom to read, think, talk, and write about things that they find interesting and rewarding. In the corporation, the firm maintains authority to determine the career path of the employee, not only at the beginning, but also throughout his/her employment. The benefit to the employee is job security (McPherson, 1983).

The tenure decision from the university comes from specific individuals within the institution. In the corporation, decisions are made in a hierarchical

manner, with high-level decision-makers determining the course of those lower. Deans and presidents may have some say in the tenure decision, most of the decision making is left up to those in the same discipline as the candidate, who already have tenure. This is called peer review. This process is closely linked to the high level of specialization in academic employment. Peer review is also cost effective, because peers can be familiar with more than just one's published work (McPherson, 1983).

One similarity corporations and universities possess is the avoidance of instituting wide merit based pay differentials for different workers doing similar jobs. Corporations do use promotions and job reassignments as tools of motivation. Monitoring senior faculty member's performance is difficult, expensive, and may have a negative effect on morale.

Trust is an important issue when dealing with post-tenure monitoring. Ensuring continued performance in faculty is challenging. One crucial point is to select beforehand faculty who possess internal motivation, or are easily swayed by moral suasion or peer pressure to perform. Another important motivation to mention is the desire for tenured faculty to desire a higher position at another university (McPherson, 1983). All of these techniques or a combination of a few are effective methods of maintaining a high quality staff. There are many differences in how corporations and universities operate. This is just one aspect of the tenure debate. An in-depth discussion of the history, impact, and future of tenure is necessary to expand one's understanding of this unique problem.

WHAT IS TENURE?

Tenure came from a German research model to American colleges and universities in the late 19th century (Worth, 1999). American colleges resembled the German Gymnasium or French Lycee until the mid-nineteenth century. Around that time, the German university evolved into one designed for disinterested research and learning, which would be intellectually independent of state control. Toward the end of the 19th century, debate between liberal and conservative benefactors brought to light the problem of academic freedom from business and legislative interest. In 1915, the AAUP spoke out against the potential tyranny of public opinion, also stating that the university should be a refuge from this tyranny. The two major causes of insecurity for the colleges and universities at the time, was the perceived danger of "foreign elements" during and after World War Two, and the financial instability during the depression era.

Academic freedom was becoming more accepted, along with academic tenure as a deterrent to threats against academic freedom, due process, and of the professor's role in decision-making, commonly called shared governance (Mortimer, 1985). Tenure and the issue of academic freedom did not come to the forefront until the early part of this century, when a Stanford Instructor was fired because Leland Stanford's widow disagreed with the leading scholars of the day, who wanted to bring attention to the issue (Richardson, 1999).

A good way to make clear what is academic tenure is to compare it to something similar, such as judicial tenure. Judicial tenure is held by federal-court judges. They will have a guarantee of continued employment until they die or retire, unless they fail to perform their functions in a satisfactory way. The purpose of judicial tenure is to protect their decision making from outside influences, such as threats of dismissal or disapproval from the executive branch. Judges must be granted freedom to make impartial judgments based on evidence and their own insights (DeGeorge, 1997).

The recruitment and evaluation systems leading to tenure in academia are similar to that in law and banking; tenure being equal to a partnership. In both cases there is a probationary period, testing, and careful evaluation by senior members, after which there is a final decision made which leads to a lifetime association. Partnerships, in law and banking, are not as secure as they used to be. Many senior partners have been asked to retire early in the face of changing economic circumstances. Colleges and universities may, in times of financial exigency, terminate tenured faculty. In law and banking partnerships, a mandatory retirement age is written in the partnership agreement. Traditionally, academic tenure was granted to faculty until they reached a mandatory retirement age (DeGeorge, 1997). Most faculty retire by or before the age of 65, or reduce their workload as they approach retirement (Cotter, 1996).

Cotter (1996) describes the tenure process at Colby College. A tenure candidate is first given a one-year contract. Midway through that year, the candidate undergoes an evaluation. After a year of acceptable performance, the candidate will be given a three-year contract renewal offer. A pre-tenure evaluation is given during the sixth semester of teaching, which is overseen by a three-person committee reviewing the candidate's course syllabi, assignments, examinations, laboratory instructions, and all material published or submitted. The tenure review committee gathers material over a six-year period, which is reviewed by the Tenure and Promotion Committee, traditionally chaired by the dean of faculty (Cotter, 1996). Mortimer (1985) writes that the tenure system has

in place procedures to prevent incompetent professors from achieving tenure in the first place. According to Cotter (1996), most Tenure and Promotion committees live by the motto: "when in doubt, do not tenure".

The granting of tenure allows faculty members certain rights, such as continuous employment, but tenure in itself is an alienable right, meaning it can be refused by a faculty member (DeGeorge, 1997). DeGeorge (1997) continues by stating that tenure is not an inalienable right. The doctrine of employment-at-will holds as far as the decision to hire someone or not. The initial hiring of a tenure candidate does not guarantee a tenure appointment, but it does become a legitimate expectation. Tenure is rarely an automatic appointment. It is granted after a probationary period of extensive performance review by committee members and/or administrators (DeGeorge, 1997).

There have been many structural changes in American higher education, because, according to Richardson (1999), of the increase in size of colleges and universities and the comparably fewer faculties hired to teach in them. The statistics that follow were taken from Ernst Benjamin's article "Declining Faculty Availability to Students is the Problem, but Tenure is not the Explanation":

> Between 1949 and 1993, the number of students being taught in institutions of higher education increased 5.4 times. The number of institutions increased 2 times, and the number of faculty increased by 3.4 times. Student/faculty ratios rose during this period from about 11: 1 to 17: 1, an increase of over 50 percent in just over forty years (as quoted in Richardson, 1999).
>
> This trend has affected tenure appointments. The following data comes from the U.S. Department of Education, dealing with the years between 1975 and 1993. The number of faculty has increased by 43 percent, from 783,000 to 1,118,293 (including 160,000 graduate assistants in 1975 and 203,000 in 1993). The number of full-time faculty has increased by 25 percent, from 435,000 to 546,000. The number of part-time faculty has increased by 97 percent, from 188,000 to 370,000. Within the full-time faculty category, the number of tenured faculty has increased by 23 percent, from 228,000 to 279,000. Within the full-time faculty

> category, the number of non-tenure track faculty has increased by 88 percent, from 81,000 to 152,000. Within the full-time faculty category, the number of probationary faculty has decreased by 9 percent, from 126,000 to 114,000 (Richardson, 1999).

From this data it is evident that part-time faculty have increased at four times the rate of full-time faculty since 1975. Tenured and tenure-track faculty now only constitute 35 percent of all of those who teach on college campuses (Richardson, 1999).

There are many perspectives concerning the economic aspects of tenure. Hallock (1995) argues that faculty with tenure have higher salaries, because the longer an individual with a given set of characteristics stays with an employer, the more he or she is paid. According to theories concerning the monopsony power of an employer (a college or university), workers with seniority suffer an earnings loss (Hallock, 1995). Williams (1991) also supports Hallock in that as tenure increases, job-specific skills are accumulated, leading to higher wages. Richardson (1999) contends that downward pressure on the salaries of academic faculty is a result of a large number of available academic workers forced to work for less. Also there are fewer purely academic positions available because:

> 1. many such positions are being absorbed by the high costs of the push towards more use of technology;
> 2. a general growth has occurred in academic bureaucracies relative to faculty numbers; and
> 3. faculty lines on many campuses are being turned into a multitude of part-time faculty positions, positions with few if any benefits (Richardson, 1999).

Many times faculty can be "fired at will" and have few if any benefits. This has resulted in fierce competition between faculty, which weakens the department as a whole. The split-labor-market theory developed by sociologist Edna Bonacich attempts to explain what happens when labor groups compete with one another for jobs and resources. The fierce competition that may result allows greater power to flow to those who make resource allocation decisions. In academia, full-time faculty fight to retain their position, while part-time and

non-tenure-track faculty fight to increase their share of salary and benefits. Faculty have lost purchasing power, as they are seen as the problem with American higher education (Richardson, 1999). In the decision to reduce expenditures, reallocate resources, and increase institutional flexibility, decision-makers have four opportunities:

1. The decision to create a position or to hire replacements for faculty leaving the institution, which is part of position control;
2. The decision about the type of appointment to make (the use on part-time or non tenure-track faculty);
3. The decision to reduce the rate of tenure-track faculty;
4. The decision to increase the number of tenured faculty leaving the institution or to develop retraining programs for present faculty (Mortimer, 1985).

In most cases institutions have gone with alternative (3), and limited the percentage of faculty that can be tenured (DeGeorge, 1997). After a basic understanding of the economics of tenure, one can move on to its benefits and shortcomings.

THE BENEFITS OF TENURE

The majority of tenure's proponents argue that tenure is necessary to protect academic freedom. DeGeorge (1997) takes this idea one step further by stating that to maintain impartiality, objectivity, and lack of pressure, faculty must be able to maintain academic freedom. Tenure protects the faculty from the repercussions of criticisms of policies and administrative decisions (Perley, 1998). Critics claim that academic freedom can be protected separate from tenure by the First Amendment. Perley (1998) argues that professors may not have the resources or the support from their board of trustees to pursue questions about the limits of their speech. The First Amendment does not protect free speech at private universities, and is limited to matters of "public concern" at state institutions (DeGeorge, 1997). DeGeorge (1997) states that:

> "Academic freedom involves the freedom to pursue one's research independent of outside political powers and pressure. Academic freedom loses its central meaning in a society in which the external powers that control the university decide what is true and what is not, and so what may be taught or published, and what may not be" (DeGeorge, 1997).

Job security is not the only goal in securing tenure. In the former Soviet Union, all workers had job security. The government was the only employer. Professors did not have tenure, because they could lose their jobs instantly, if they taught or published what was ideologically unacceptable, after 1931, that being Marxism. Academic freedom did not exist in this environment (DeGeorge, 1997).

Another argument used to support tenure is the idea that given the time and study necessary for professors to attain their position, they trade job security for low salaries. DeGeorge (1997) argues that faculty salaries were low before academic tenure came on the scene, and if faculty salaries were commensurate with the amount of study required to hold such a position, tenure would not be justified (DeGeorge, 1997).

Tenure is beneficial to academic institutions because it keeps faculty salaries down (DeGeorge, 1997; Morrell, 1994). According to Morrell (1994), colleges and universities monitor their expenditure levels through the Higher Education Price Index (HEPI), which measures the average relative level in the prices of goods and services purchased at academic institutions. Faculty salaries constitute less than one-third of the total operating expenditures (excluding financial aid). To reflect the permanent nature of the positions, the laws of economics dictate that salary levels for long-term, continuing faculty members continue to be relatively low (Morrell, 1994).

Tenure gives a college or university the competitive edge necessary to obtain the best and brightest graduate students. Elimination of tenure might make the teaching profession less attractive to new graduates, and could cause institutional instability because of increased mobility (Cotter, 1996; Morrell, 1994). Tenure cuts costs to an institution by eliminating high rates of turnover and costs of recruiting (DeGeorge, 1997). Cotter (1996) writes that tenure actually liberates the faculty member to become more productive and contribute more to the academic quality of the institution.

McPherson (1983) writes that macroeconomic studies show a mutual benefit between workers and firms when long-term, stable employment relations are sustained. Tenure protects against special problems that arise with highly specialized employees. Tenure has efficiency properties, also. The productivity of an organization depends on the character of the work environment. Turnover is costly because of training costs and accumulation of information. Mobility is expensive for employees, because of the search and relocation costs. McPherson (1983) also writes about wage and promotion structure, and how it helps to secure the relationship between the worker and the firm. The firm invests in the worker, both by training and by accumulation of information about his/her strengths and weaknesses. The worker accepts a low initial wage, which only makes sense if he/she is willing to stay long term. This type of arrangement will be self-enforcing because the worker and firm have a mutual interest in placing the worker where he/she will be most productive, and at a wage that the employee will be willing to maintain (McPherson, 1983).

Cotter (1996) states that faculty are the continuing heart of a college or university. Regular turnover occurs with students, trustees, presidents, and staff, but tenured faculty, make a lifetime commitment. It is beneficial to academic institutions to provide a stable environment in which creativity can be liberated and faculty will sustain their dedication to their life work. Faculty has a vested interest in an institution's values and quality. Cotter (1996) continues to make the point that faculty members are depended on to volunteer for advising, mentoring, and committee service, most of that work is done by tenured faculty.

The academic institution must ensure that it tenures quality faculty. This is a problem unique to the academic marketplace. The probation period is a viable solution to this problem. There are four distinct ways to express the value of the probationary period:

1. *Performance monitoring*; teaching and scholarship are hard to measure, and quite costly. It is possible to adequately monitor these activities over a long period of time at a lower resource cost.
2. *Self-selection*; the danger in this is the vulnerability of the employer to believe misrepresentations of the candidate. This is remedied by the probationary period and the reasonably likely chance of dismissal. The longer the probation period, the better chance of screening out any

unsavory candidates.

3. *Time to tenure as an economic variable*. The university can use variations in the length of the probation period to vary the value of its employment as market conditions change.
4. *The focusing of monitoring resources*; limiting the probationary period to a reasonable amount of time ensures that the candidate is evaluated carefully, and it cuts back on the tendency to postpone firing anyone, which is an inefficient use of time and resource. (McPherson, 1983).

After the probationary period and tenure appointment, post-tenure review becomes an issue. Critics of tenure claim that faculty members may reduce their efforts once they obtain the lifetime security of tenure. In response to these critics, Cotter (1996) states that evaluations do not end with tenure. Student evaluations rate faculty's effectiveness at the end of every course. Some institutions maintain a merit salary system, in which a faculty member's work is reviewed periodically. Its incentive is monetary and can add thousands of dollars to lifetime earnings. Additionally, faculty can be dismissed with adequate cause. This system, properly in place, will motivate tenured professors to remain productive (Cotter, 1996). DeGeorge (1997) asserts that as a faculty member ages, they usually grow in wisdom and experience, which is invaluable to the students and the institution.

Other criticisms include the possibility that young faculty are facing less opportunity for full time employment when tenure is in place. This is true, but tenure is not the cause, instead it is because retired tenured faculty are being replaced by part-time and adjunct positions (Perley, 1998). Critics of tenure also claim that it hinders an institution from making curricular changes that are responsive to student demands and changes in society. In fact, most faculty members regularly update their own material and may even introduce new courses. There is significant turnover, resulting from retirements, resignations, denials of tenure, and contract renewal for colleges and universities to make new appointments (Cotter, 1996).

There are many non-economic criticisms of tenure including the deadwood argument, the six-year conformity argument, the post-modernist argument, and the politicization attack. DeGeorge (1997) answers these critics by explaining that if a faculty member fails to perform his/her duties, he/she can

be dismissed. Poor performance does not necessarily reflect on tenure itself, but the individual. The six-year conformity argument states that the candidate will conform for a short period of time to achieve tenure and then change. In response, DeGeorge (1997) writes that this is an abuse of the tenure system, not a result of the tenure system.

As far as there being no absolutes, this is a matter of opinion. DeGeorge (1997) believes that there are still absolute truths and knowledge to be pursued. The post-modernist view does nothing but damage the discipline involved in this belief. Politicization is a problem, and if it does exist, it should be remedied, but again this does not reflect on tenure, but the institution (DeGeorge, 1997).

If the tenure system were abolished, unions and collective bargaining would replace tenure (Mortimer, 1985). The collective bargaining process cannot protect society's interests or academic freedom. It could also, according to Mortimer (1985), polarize viewpoints, rigidify tactical positions, delay resolutions of dispute, politicize faculty and students, and induce resentment, slowdowns, and boycotts in an effort to influence negotiations. There are many critics who would like to see tenure abolished. The effects of this action are unknown. It is safe to say that an institution that has been in place as many years as tenure, must have some value. It is now time to turn to some of the evidence supporting the abolition of tenure.

CRITICISM OF TENURE

Criticisms of tenure stem from a variety of academic scandals, such as grade inflation, the over-use of teaching assistants to perform up to 40 percent of the instruction, and the faculty members failure to pay adequate attention to their students by not keeping posted office hours, etc. The tenure system came under attack after World War Two, and has been blamed for some of the uprisings on college campuses in the 1960s. The attack on tenure has taken several forms: direct, such as legislation to abolish tenure, and indirect, which comes from internal and external sources (DeGeorge, 1997). Internal criticisms include junior faculty's disdain for tenure, administration's frustration with slow change stemming from shared governance, and presidents, who doubt their ability to lead when tenure allows professors to strive to fulfill personal goals and not work toward institutional goals (Trower, 1999). Many external attacks on tenure are economic. The most frequent is the deadwood argument. It claims that pre-tenured professors work hard until they become tenured, after which they

become lazy; teaching, but not doing research, or being published, and spending little time and exerting little energy with students (DeGeorge, 1997).

The next charge is inefficiency. Comparing an education institution with a corporation, critics claim that colleges and universities are saddled with too many tenured professors in the wrong area, and because of tenure they cannot "downsize" that area. Critics also claim that colleges and universities have no incentive to be productive because they do not face any real competition and are usually not-for-profit (DeGeorge, 1997). Critics often question the cost effectiveness of tenure. Tenure holds inherit value. This is proven in the exercise of thinking of two identical jobs, except one has a lifetime guarantee. Which one is more likely to be chosen? The one with the lifetime guarantee. If lifetime employment were cost effective, why is it not more wide spread? In reality, lifetime appointments reduce flexibility, and a profitable business must have the ability to get rid of unneeded resources. Tenure prevents efficient resource allocation. Though it is commonly believed that tenure keeps costs down, in reality, overall labor costs may increase because additional faculty may need to be hired to fill needs in popular disciplines (DeGeorge, 1997).

Mortimer (1985) found that a high tenure ratio is one indicator of potential danger in faculty personnel systems. If an institution has a high tenure ratio, it will have more difficulty in opening and closing academic programs, freeing resources to respond to shifts in student demand and/or improving the quality of existing programs, and providing for institutional renewal by hiring new faculty (Mortimer, 1985).

Dismissing "deadwood" faculty can prove to be difficult. DeGeorge (1997) writes that it is expensive and time consuming as in the example Michigan set with passing the Teacher Tenure Act in 1937. Labor law in Michigan has evolved so that tenure is no longer necessary. Dismissing an incompetent instructor is expensive, averaging between $50,000 and $70,000 (DeGeorge, 1997). Tenure adds costs to the education system by burdening institutions with high labor costs without adequate output in return (Morrell, 1994). In 1992, the University of Minnesota and the University of North Carolina at Charlotte made a surprising discovery. For several months, a faculty member had been holding tenured positions at both schools, commuting regularly between them. It took Minnesota two years to dismiss him (Trachtenberg, 1996).

Is tenure necessary for academic freedom? Many say no. Novelists, playwrights, journalists, editors, songwriters, clergy, film producers, actors, cartoonists, and whistleblowers challenge orthodoxy without lifetime employment

(DeGeorge, 1997). The consumers of education, students and taxpayers, cannot pick and choose what they find acceptable to support, like the typical consumer can when watching television or reading a periodical. The main threat to academic freedom is a tenured professor who may not like the views of a tenure-track professor, or an institution that will not allow some speakers on campus because of a lack of political correctness (DeGeorge, 1997). According to Worth (1999), the arguments for tenure and academic freedom fail because the two issues are separate.

Does tenure guarantee high quality? Again, many say no. Many times good instructors are denied tenure at the most prestigious universities. For example, three-fourths of the recipients of Harvard's outstanding teaching award were denied tenure. As one critic says, in the modern university, no act of good teaching goes unpunished. The probationary period is too short to properly evaluate a faculty member. Many times the probationary period is too short for a candidate to complete and evaluate research to be published. This is a lose-lose situation for everyone involved. The university's policy of up-or-out may lose them an outstanding faculty member, also causing upheaval in the professor's life (DeGeorge, 1997).

Other criticisms of tenure include the out of touch professor, who loses touch with changes in their field, and loses interest in teaching. Eventually, research will become paramount, and even a self-justifying enterprise. Tenured professors teach less than ever (Worth, 1999). Tenure prevents schools from holding faculty accountable or changing with the times. The tenure process can cause candidates to over specialize, limiting their scholarly value to marginal areas. Worth (1999) writes, "tenure's rigidity makes it difficult for schools to adopt changes in knowledge" (p 2).

The elimination of tenure would deny job security to incompetent faculty members, it would expand the flexibility the administration has to improve education quality by improving faculty quality (Mortimer, 1985). There are numerous people who like to see tenure abolished. DeGeorge (1997) believes that little changes would occur if tenure was abolished. Deadwood professors would not be fired, and it would be impossible to abolish tenure retroactively. DeGeorge (1997) maintains that it would make an impact on academic freedom and would possibly increase faculty unionization. In 1995, the American Association for Higher Education (AAHE) released the following observation:

> "In a 1989 survey of 5,000 faculty by the Carnegie Association for the Advancement of Teaching, 29 percent of all faculty, 32 percent of female faculty, and 39 percent of faculty under the age of 39 agreed with the statement concerning the abolition of tenure would, on the whole, improve the quality of higher education" (DeGeorge, 1997).

When such a long-standing tradition is dissolved, something must be available to take its place. Are there feasible alternatives?

ALTERNATIVES TO THE TRADITIONAL SYSTEM

Florida Gulf Coast University (FGCU) broke new ground when they opened their doors. This university is a business-based model that recruits faculty using multi-year contracts instead of tenure. For the 1997-98 academic year, FGCU hired 92 new faculty. Seventy-five (75) percent of the new hires had doctorates, more than 80 percent of the new hires were previously employed at other colleges or universities, 15 percent relinquished tenured positions, and 22 percent abandoned tenure-track positions (Chait, 1998). Surprisingly, the university was able to hire first and second choices without the promise of tenure. Many of the new faculty members were burned out by other tenure systems. FGCU offered a clean slate for many, and the idea of team teaching appealed to many (Chait, 1998). This university, if successful, will serve as a model for other institutions that want off the tenure track.

There are many alternatives to tenure. Perley (1998) suggests that it be sold for higher salaries. Yarmolinski (1996) suggests the idea of greater institutional flexibility and the positive advantages of tenure. If tenure contracts were negotiated, at the time the candidate was hired, through the department, or even traditionally, through the institution, the scope of tenure could be renegotiated from time to time to fit each candidate individually. Another alternative is to offer tenure to general education instructors, or a team of teachers. This could avoid the burnout that is so common (Yarmolinski, 1996). Yarmolinski (1996) also offers three ways to reconcile academic tenure and institutional change:

> 1. Individual scholars need assurance that they can

pursue their interests freely;
2. Institutions need to be able to allocate and reallocate resources, including scholarly talent; and
3. Tenure is in place to protect the nonconformists (Yarmolinski, 1996).

Worth (1999) suggests that academic institutions offer faculty a choice: traditional tenure or a limited-term contract with a higher salary. North Carolina's Evergreen College started offering 10-year contracts as an alternative to tenure in 1992. About half of the faculty have accepted the contracts. The Boston University School of Management started offering the same thing in 1995 with similar results (Worth, 1999). Trower (1999) agrees with the premise of offering a choice between tenure track and multi-year contracts. A balance between the two is the most desirable, allowing faculty more flexibility (Worth, 1999).

Term contracts have an efficiency appeal. In reality, according to McPherson (1983), the resources required to evaluate everybody seriously every few years would be enormous. The threat of job insecurity might make it more difficult to hire quality faculty at a competitive wage, one that is comparable to those at institutions offering more security. A more than likely result of term contracts will become instant tenure, because contract renewals could have a tendency to become routine. If contracts prevail and renewals are decided on by fellow professors, there is pressure to be compassionate toward their fellow contract holder (McPherson, 1983).

Mortimer (1985) suggests growth contracts for faculty to counteract complacency. Growth contracts would be used concurrently with tenure. Every faculty member states their own personal goals for the next five years. These goals will be held as an expectation by the institution and can pump new life in potential deadwood. Benefits of this idea include unity within departments, motivation of faculty, and it is consistent with an institution's educational objectives (Mortimer, 1985). Early retirement incentives are also important when dealing with tenure alternatives. Mortimer lists five basic incentives:

1. Early retirement benefits that are larger than actuarial tables would justify;
2. Lump sum severance payments;
3. Annuity enhancements that increase early retirement

	income to the amount the employee would have received at normal retirement age;
4.	Phased retirement or part-time employment; and
5.	Continuation of fringe benefits (Mortimer, 1985).

Reduction in workload is an option for many aging professors, and incentives for this could include continued contributions to a pension fund, and supplemental income. The extra costs can be recovered by not filling the vacated positions. This is a viable way to reallocate resources from one department to another.

DeGeorge (1997) offers this advice: allow colleges and universities the freedom to choose if they want tenure or not without fear of losing accreditation. This gives consumers a choice. Consumer dollars are the best way to reward good academic institutions and punish bad ones. This is only possible if the government is taken out of the picture. Government funding prevents colleges and universities from being sensitive to consumer demands. If the present education system changed into a consumer oriented one, many possibilities emerge. Some may hold on to traditional tenure systems, while others might eliminate it altogether, while others might mix tenure and renewable contracts. The market might develop unique alternatives to this problem (DeGeorge, 1997).

Post-tenure review is a source of great debate. High turnover is an anticipated problem with multi-year contracts and post-tenure review. Trower (1999) suggests that a truly effective and meaningful post-tenure review process is like having a contract. Once teaching productivity increases and reaches a summit (after tenure is abolished), there is a balance and turnover will not be a problem (Trower, 1999).

There are consequences for the suggested structural changes. Richardson (1999) argues that eliminating tenure threatens not only academic freedom, but also higher education and the democratic society in which it exists. The corporate mentality is chipping away at tenure and academic freedom, with the hiring of non-tenure-track faculty and part-time faculty instead of tenure faculty. It seems as if decision-makers have determined that academic freedom in an unneeded luxury. Term contracts are offered and often snatched up because of the state of the academic labor market. This, in turn will continue to damage the labor market by making educated people, who want a teaching career, into laborers with little economic security. Little opportunity, insecurity, and frustration have become commonplace in the academic labor market (Richardson,

1999). This scenario affects the consumers of education worst of all. Richardson continues by writing that America needs to attract the best minds, and this is only possible if they have a secure future (Richardson, 1999).

CONCLUSION

Is there an answer to the tenure debate? There are many credible arguments on both sides of the issue. They do not solve all the problems associated with the inefficiency in the academic institution, academic freedom, shared governance, or education quality. In the research that was sought out, not one set up the academic institution as a for-profit business. The two were compared, and the entrepreneurial model was presented. If a university could be set up as a corporation, the issue of academic freedom might not be addressed to the satisfaction of the elite of academe. One has to question the motivation of the argument of academic freedom. Does it truly exist? Even in the first months of the 21st century, there are issues that are taboo, especially those issues that threaten the advocates of this so-called academic freedom. It is questionable that an academic institution could ever be consumer driven. The government plays too big of a regulatory role for a for-profit university to succeed. DeGeorge (1997) writes that colleges and universities are insulated from free market competition. They cannot offer something radically different to attract students (DeGeorge, 1997). If a corporation were limited in what they could offer consumers, they could not survive. Colleges and universities are allowed to survive through the use of government funding. Trachtenberg (1996) states that if higher education is able to keep up with changes in the marketplace, it must be restructured. The question remains, can tenure go hand in hand with these changes? Morrell (1994) writes that tenure should remain in place while the necessary changes are made.

Williamson (1996) writes that in order to determine if a college or university would be better off with or without tenure, one can use transaction cost economics and comparative institutional analysis, by which alternatives are compared for completing a task. The theory states that an outcome for which no feasible superior alternative can be described and implemented with net gains is presumed to be efficient (Williamson, 1996). Depending on one's outlook, tenure maybe the most effective alternative or it may not.

Trachtenberg (1996) maintains that academic freedom must be protected regardless of what happens with tenure. His principles follow:

1. The restoration of the status quo ante, with the ante defined as the age when tenure was in effect a 30 to 35 year contract, must be in place.
2. The education and re-education of the American public by faculty members in higher education must provide their fellow citizens and political decision makers with facts that overcome the automatic linkage they are tending to make between tenure and the abuse of tenure.
3. Active support for the notion of defined and limited teaching contracts that would replace the award of tenure. Contracts can be for any number of years, subject to periodic reviews, with due process (Trachtenberg, 1996).

The solution is feasible. It is not practical to totally change the academic atmosphere to one that is corporate-like. This will be an ongoing debate throughout the new millennium.

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THE CONSEQUENCES FOR BUSINESS OF GOVERNMENT ACTION IN AN ECONOMIC DOWNTURN

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ABSTRACT

A nationwide recession is impossible to predict, even for the US government. However, whether or not a recession is formally confirmed, the Federal Government acts on several fronts to reverse the decline. Managers who know how to monitor a changing economic landscape and who can correctly forecast the powerful impact of government responses to a recession on their business are in position to optimize. This article reviews recent economic downturns in the United States and the Federal Government's responses to them to proffer crucial insights for managers when they face a recession.

In anticipation of worse tomorrow, producers and consumers become conservative spenders. Lower spending levels lead in short order to lower production, to lower employment, to lower spending. This period of economic decline is a recession. It is the contracting phase of the economic cycle and it ends when a critical mass of consumers realizes that the structure of the economy is sufficiently sound that tomorrow will in fact be a better day. They also realize and react to the belief that between now and then there are some incredibly good deals to be had in almost every marketplace.

THE NATURE OF RECESSIONS

The United States Government defines a recession as at least two consecutive quarters of falling Gross National Product. The GNP is the total value of final goods and services produced and consumed in the US. It is the broadest measure available of economic output and growth. Declines in industrial production, employment, and real disposable income also accompany recessions. Since World War II, the United States has experienced eight economic recessions, the latest of which ended in 1991. The average recession

during this period lasted 11 months and reduced real GNP by 2.6%. Each downturn wreaked havoc on the economic well-being of many elements of society.

The 10-year span since the last recession is seen by a few analysts as supportive of their notion that recessions are under control due to the actions of governmental agencies. However, the vast majority of economists, including those employed by the Federal Government, look suspiciously at the length of the current prosperity. Since national growth peaks and ebbs, and since no post-war period has previously extended for a decade without a significant economic decline, forecasters are keeping a wary eye on indicators of the country's health.

Recessions are precipitated by- policy missteps, shocks to the economy, and structural adjustments, often in combination. The two recessions of the 1980's developed as the government attempted to bring down double-digit inflation by tightening the money supply. Investors anticipated that tight monetary policy and credit controls would generate a mild recession in 1980. They were right. The Dow shed 16% from February to April 1980, and the recession lasted from January to July 1980.

Convinced that the downturn was over in April 1980, investors mounted an exuberant and broad-based rally that featured a 35% rise in the blue chip index. However, the Federal Reserve Board tightened credit again in the fall of 1980. The result was a new recession that began in July 1981, and became the second most severe in post war times.

The Government Mandate

An evaluation of recessions must consider the Federal Government's role in economic cycles. Since the Depression, when 25% of all workers lost their jobs and majority of the US citizens encountered extreme hardships, the US government has created a number of programs to avoid deep recessions. Government policy makers try to reduce extreme variations in the business cycle through short-run stabilization policies.

Prior to the Great Depression, the consensus among economists was that the economy was self-regulating. However, by the end of World War II, Congress made explicit the federal government's responsibility to stabilize economic activity in the short-run. The Employment Act of 1946 declared that the federal government is responsible for promoting "maximum" employment,

production, and purchasing power sufficient to smooth out fluctuations in economic activity.

To moderate recessionary periods, the Federal Government makes counter-cyclical payments to eligible unemployed or disabled citizens. It also designs fiscal and monetary policies to avoid recessions and extend recoveries. The success of these government efforts was seen in the most recent recovery period of 1992-1993, which was helped by substantial decreases in short-term interest rates that were initiated by the Federal Reserve Board.

The Business Cycle

Business cycles describe the fluctuations of economic activity that result from severe variations in the plans of buyers and sellers. Cycles consist of two phases: expansion and contraction. Increased inflation, business activity, and rising employment characterize the expansion phase. The contraction phase, which includes recessions, is characterized by stable or falling prices, excess production capacities, reduced interest rates, heavy corporate debt, reductions in corporate spending, stock market decline, rising business failures, declining real earnings, and high levels of unemployment.

Tools for Forecasting a Recession

There are many variables to measure and evaluate in trying to discover the causes and effects that result in a recession. This extremely complicated process defies timely, simple or certain analysis. Therefore, the resources of the Federal Government are needed to undertake the task. The US Department of Commerce gathers and publishes statistical data on the GNP and other leading economic indicators to aid in the prediction and interpretation of recessions. For example, GNP growth was a weak [1].1% in the fourth quarter of 2000 with all major non-government components decelerated or turned downward at the end of the year. Other recession warning signs that were included in the GNP report were that exports fell by 6.1% following robust growth in the previous two quarters, and that business IT investment decelerated sharply for the third consecutive quarter.

Perhaps the most popular and widely accepted methods for predicting an economic recession involve the examination of eleven leading, or foreshadowing, indicators of the overall trend of the economy. The data for the analysis of the

Index of Leading Indicators (LEI) includes stock prices, commodity prices, consumer expectations, consumer goods orders, the money supply, the length of the work week, the number of order backlogs, the number of plant and equipment orders, the number of unemployment-insurance claims, the number of building permits being issued and the length of vendor delivery times. A recession is technically said to exist when the LEI has declined for three consecutive months.

For most businesses, demand for goods and services can be directly related to one or more of these indicators. For example, the demand for semiconductor chips is well correlated with overall growth in industrial production. The shifts in the phases of the business cycle also can be invaluable in influencing decisions on production, inventory and manning levels, marketing strategies and pricing (Pearce & Michael, 1997; Sykes, 1993).

A lesser-known but more successful forecasting model is the experimental recession probability index (XRI). The XRI combines the coincident economic indicators (CEI) and the LEI. The CEI involves a weighted average of four factors: industrial production, real personal income less transfer payments, employee-hours in nonagricultural businesses and real manufacturing and trade sales.

Another econometric model is the Turning Point Recession Index (TPRI) that involves examining the peaks and valleys of the economic cycle. TPRI attempts to forecast a recession by predicting a behavioral switch in the economy from an expansion to a contraction. The model has performed well except in predicting the 1990-1991 recession. Relating economic changes in 1990 to past economic fluctuations, which is what the TRPI does, allowed the 1990-1991 recession to escape detection by the TRPI method (Huh, 1991).

Simple predictors of recession also have supporters. For example, until 1991, a recession followed whenever short-term interest rates rose above long-term rates. When this happens there is an inverted yield curve. The yield curve shows interest rates along the maturity spectrum from 3-month Treasury bills to 30-year Treasury bonds. Interest rates reflect the price of money and reveal consumer expectations about growth and inflation and their preferences for saving versus spending. Therefore, when the yield curve has a positive slope, the public is expecting economic growth and higher interest rates. When the curve flattens or is inverted, the opposite occurs, the public expects the economy to weaken and fall into a recession (Pennar, 1995). Unfortunately, because the yield curve was not inverted in 1990, many economists who relied on this approach failed to predict the recession correctly.

Other analysts rely on consumer perceptions to gauge a recession. The Survey Research Center of the University of Michigan and the Conference Board publish monthly statistical indicators based on household perceptions of the economy. The Survey Research Center's consumer sentiment index reflects consumers' attitudes toward the economy and the job market, and their perceptions about purchasing durable goods. The Conference Board's consumer confidence index similarly measures consumers' attitudes toward the economy, job market and their own financial situation. When these measures reflect negative changes, a recessionary climate exists since consumer spending accounts for approximately two-thirds of the GNP (Shama, 1993).

Additional economic forecasts are available to managers that may provide predictions more specifically geared to their industry or geographic area. The National Association of Purchasing Managers (NAPM), Blue Chip Indicators, National Bureau of Economic Research, Chicago Purchasing Managers index, the ECRI Future Inflation Gauge, and government reports of construction spending, factory orders, worker productivity, layoffs, and housing starts. Additionally, several research associations and financial institutions assess recessionary conditions. For example, as mentioned in the introduction, the monthly index of the National Association of Purchasing Management is seen as a precursor to the more encompassing measures of the GNP and LEI.

Lagging Measures

Due to the ex-post nature of economic measures, there is an inherent lag in obtaining data from the Government for managers to use in trying to interpret economic conditions. Not surprisingly, one of the primary hurdles for managers is in recognizing that a recession is underway in their industry. The evaluation problems are further complicated by the geographical variability of a recession. Recessions do not occur everywhere simultaneously.

A manager's recognition of unusual economic patterns and changes can be the difference between success and failure. In the late 1980's, those who failed to detect slow growth in the service sector, the saturated real estate market, the regulatory problems in the banking system, and the increasing consumer debt ratio found themselves less prepared than their economically attuned competitors to cope with the economic downturn of 1991.

INFLUENCES OF GOVERNMENT POLICY

To minimize the severity and duration of recessions, the US government relies on monetary and fiscal policy. The government is dependent on the implementation of economic policies to reduce the impact of recession by encouraging investment and economic growth, thereby reconfirming long-run economic stability.

Taxes allow the government to fund spending initiatives, thus funneling capital back into the business community through government spending. Savings held by financial institutions allow businesses to grow by providing funds for investment. Both government spending and investment stimulate business productivity and growth, leading to increased profits, income, and possibly employment.

The goal of both fiscal and monetary policy is to maintain a balance between aggregate demand and production capacity by inducing business and consumers to alter their spending habits. Government policies reflect the fact that even a relatively small fluctuation in the business cycle can greatly increase or decrease the influence of any other factor as the fluctuation's impact works its way through the money flow. With fiscal policy, the government adjusts personal and business taxes as well as government spending to influence the spending patterns of business and consumers. The Federal Reserve influences interest rates and controls monetary policy, which impact business and consumer behavior.

Fiscal Policy

Fiscal policy, determined by the President and Congress, can moderate or stimulate demand and provide incentives to work, save, and invest. Fiscal policy focuses specifically on government outlays or tax issues and is implemented either through automatic stabilizers or discretionary policy.

Automatic stabilizers are built-in mechanisms in the economy, put in place by the government to reduce the amount by which output will be impacted by changes in autonomous spending. Specifically, they act as economic buffers by automatically reducing taxes and increasing transfer payments, and they are an integral part of the government's overall fiscal policy.

An important automatic stabilizer in the US economy is the progressive income tax. One impact of the recession is that real wages decline. With a flat tax rate, this decline in real wages directly decreases individuals' ability to consume and decreases aggregate demand. Decreased consumption can intensify

recessionary pressures by leading to an eventual decline in output and employment. As the Bush administration argues, with a progressive tax rate, aggregate demand is less likely to falter with fluctuations in the business cycle because taxes contract with a weakening in the real wages, thus preserving purchasing power.

Managers should consider the implications of the 2001 tax cut plan on their company and its effect in stimulating business activity. The Bush Administration program, with its across-the-board rate reductions, was useful in putting dollars directly into the hands of consumers. Individual taxpayers received a one-time $300 check from the government to re-energize spending. The initial, retroactive tax cuts were especially beneficial for business since taxpayers received tax refunds by mid 2001. Tax rate reductions will continue in subsequent years. All but the bottom tax bracket will drop by three percentage points over the next five years, and the top bracket will be cut by 4.6 percentage points. Thus, Bush's ten year, $1.35 trillion program provided some immediate tax relief designed to stimulate the economy, with most of its anti-recession effects expected long after the 2001 threat is over.

Another great-for-business option would be an immediate lowering of federal withholding from paychecks since workers would see more money in their paychecks. The larger the withholding cut, the better for business. Small tax cuts are often used by middle-income taxpayers to pay down high levels of debt rather than to make consumer purchases. Managers also want to watch for the size of any tax increases.

An increase in transfer payments is a second type of stabilizer. These include such government spending programs as unemployment compensation, food stamps, welfare programs, and Medicaid. Transfer payments are designed to reduce fluctuations in aggregate demand and automatically increase with a decline in real wages. With the implementation of automatic stabilizers, personal disposable income actually rises relative to GDP during a recession, because transfer payments increase while total income taxes collected are reduced.

While the goal of automatic stabilizers is to maintain a stable level of aggregate demand, they cannot be used too extensively without negatively affecting the overall performance of the economy. Heavy reliance on stabilizers can lead to a long-run increase in the federal budget deficit. The potential dangers of this problem were compounded by the 1990 revisions to the Gramm-Rudman-Hollings balanced budget law that allow an even higher federal budget deficit target when the economy falters (Berry, 1991).

The presence of automatic stabilizers benefits business by sustaining consumer demand. However, stabilizers only serve to cushion the impact of recessionary pressures. In the trough of the 1990-1991 recession, one-fourth of the households reported being more deliberate in their purchases and more sensitive to price. Because of increased anxiety that they felt when purchasing, consumers also forewent or delayed purchases (Goodell & Martin, 1992). Similarly, businesses that alter their own spending plans are better positioned to weather recession-prompted decreases in consumer spending. A final consideration is that automatic stabilizers become less effective with an increased budget deficit.

Fiscal and Monetary Policy

Stabilizers must be supplemented with comprehensive fiscal and monetary policy to reduce the impact of a recession more fully. Increasing government spending and cutting taxes are useful policy options. Government spending on such issues as health, education, roads, and technology are all effective methods of reducing the impact of recession by funneling government funds into the private sector. Tax cut targets include capital gains taxes and investment tax credits.

A cut in the "capital gains tax" is one way the government can reduce the impact of recession by stimulating private investment and employment. With lower capital gains taxes, investors realize capital gains more frequently on stocks and assets because they are less affect by any tax implications.

A temporary investment tax credit is another effective measure for stimulating economic growth and reducing the impact of a recession by encouraging businesses to invest in new equipment. It produces a short-run increase in investment spending currently planned and encourages unplanned expenditures (Murray, 1991).

Investment tax credits and capital gains tax cuts are both important to business. In their absence, many firms cut spending on R&D and product innovation during recessionary times, making recovery more difficult. Consequently, to reduce the impact of an economic recession, decreasing taxes and increasing government spending can be effective short-run tactics. However, they can also compromise the long-run viability of the economy by increasing the federal budget deficit. For example, because of the US's large budget deficit, federal government purchases and transfers did not increase as dramatically

during the recovery of the 1991-92 recession as they had in past recoveries (The Economic Report of the President, 1993). Partially as a result, the recovery was the slowest on record.

Monetary Policy

The Federal Reserve, a quasi-independent federal agency, controls monetary policy through open-market operations that adjust the money supply and interest rates. These actions directly impact output and inflation. Business and consumers are particularly responsive to changes in the interest rate. A small decrease in interest rates has the potential to result in large increases in output and consumer income.

Monetary policy can be "expansionary" or "tight." Expansionary policies aggregate demand by increasing the money supply, which leads to lower short-run interest rates. Lower interest rates stimulate business and individual investment, output, income, and spending. Investment in interest-rate-sensitive sectors such as banks and utilities also tend to jump favorably from decreases in interesting rates.

Tight monetary policy is designed to control inflation. If economic growth exceeds the Fed's target of approximately 2.5%, action is taken to slow the growth. A decrease in the money supply increases interest rates. Therefore, consumers are more inclined to reduce consumption and increase savings. Obviously, decreases in spending impact business greatly. With purchases down, inventory levels rise, leading to excess supply and disequilibria. Consequently, firms will decrease production and supply, negatively influencing growth.

Monetary verses Fiscal Policy

To reduce the impact of the recession, total spending must be stimulated. Monetary growth aimed at the reduction of long-run inflation is usually more effective than changes in fiscal policy. Fiscal policy alone is discouraged because increased government spending and tax cuts provide only short-run solutions and can lead to increased deficits in the long run.

Consumer opinion also favors a less intense use of fiscal policy. A 1990 consumer poll found that only one in four of those surveyed favored increased government spending to reduce the impact of the recession. In contrast, two-thirds advocated no increase in government spending (Wessel, 1990).

Timing Issues

The timing of the impacts of fiscal and monetary policy varies because of the type of policy that is used and because of several lags that are inherent in the system. Policies are either rules-based or discretionary. A policy is "rules based" when it has previously been determined and is set in motion at a predetermined date or economic performance trigger point. Automatic stabilizers are a good example. On the other hand, discretionary policies invite substantial discussion and debate before implementation. Therefore, discretionary fiscal and monetary policy can be delayed due to lags between problem recognition, policy formulation, and economic response. To the extent feasible, managers who try to anticipate an economic recovery must take these lags into account.

With discretionary fiscal policy, the actual influence of a policy decision is not felt right away; there is a time lag. The time between when an economic disturbance occurs and when policy makers realize the need for action is a "recognition lag." Information about the state of the economy must be gathered and economists must try to determine precisely what is happening concurrently to capital formation, unemployment, changes in prices, and other economic performance indicators. Problematically, accurate information about the entire economy often lags actual performance for months. In other words, the government can rarely inform private sector managers that the economy is in a serious decline until several months after the slide has begun. Studies of policy making have identified the average recognition lag to be five months. This lag is shorter when the need is for expansionary policy and longer when restrictive policy is dictated.

The "policy formulation" lag is the time between the recognition of the need for action and the actual policy decision. This lag can be especially long for changes in fiscal policy involving tax laws meant to stabilize the economy. For example, the approval process for fiscal policy can include debate by both houses of the Congress, often a long and arduous process.

Monetary policy typically does not suffer from a policy formulation lag because the Board of Governors of Federal Reserve System meets thirteen times a year and can almost instantaneously put into effect upon which any policy it decides. Once the policy action has been taken, however, there remains one final delay, the "distributive lag." The effects of the increased government spending take time to work. Similarly, the effect lag of fiscal policy change can be

distributed over a period of several years. Such variability in the length of distributive lags creates inherent problems in trying to stabilize the economy.

Consumer Expectations

Consumer and business expectations can greatly influence the effectiveness of fiscal and monetary policy. Fiscal policy can affect behavior by changing the consumers' level of disposable income. However, if consumers and businesses view this change as temporary, as should be the case with a tax surcharge, behavior will be affected less dramatically. Similarly, if the policy is not viewed as immediately important, as might occur with a tax investment incentive, business will have little motivation to invest during a period of declining growth. Additionally, when the federal government's deficit is large, consumers view tax cuts as temporary and do not change their spending (The Economic Report of the President, 1993).

Global Considerations

A decrease in the US interest rate can positively impact the trade balance. Low interest rates stimulate a capital outflow because investors will move their investments from the U.S to take advantage of higher returns in other countries. Falling demand for dollars by investors decreases the currency's relative value. A depreciation of the exchange rate makes US goods less expensive compared with foreign goods, shifting demand toward US domestic goods by increasing exports as well as discouraging consumers to substitute more expensive imports. These changes in consumer behavior positively impact domestic producers, leading to an increase in output and income. Thus, the government's recession policies impact consumer spending and interest rates impact trade and capital flows, directly influencing the well being of the economy.

Actions of the Federal Reserve

The Federal Reserve Bank of the United States occupies a unique position in the US economy. The Fed's goal for the US economy is to prevent inflation and promote long-term price stability as a strategy for achieving maximum long-run economic growth. The Fed acts on the economy by manipulating the Federal Funds Rate, the Required Reserve Ratio, and by selling and purchasing

Treasury securities. Whether the actions have the desired effects is determined by the subsequent responses of banks, businesses, and consumers.

A major problem for the Fed is the difficulty involved in measuring and analyzing the health and direction of the economy. The complexity of the economic environment makes it difficult for the Fed to know exactly what effect its actions will have on institutions, businesses, and individuals. Thus, the Fed indicates what it would like to see happen, adjusts a variable under its control, and waits to see the results.

It is useful for managers to have a sense of the mentality of the Federal Reserve. The Fed is dominated by "inflation hawks," led since August 1987 by Chairman Alan Greenspan. The inflation hawks believe that low inflation is the most important factor in fostering long-term price stability and growth in real output. Committee members often reconcile the two policy objectives by viewing price stability as a long-run goal and sustained real output growth as a short run goal.

The Fed also monitors the possibility of recession by analyzing key economic data - such as housing starts, consumer spending, and producer prices. At the sign of a downturn, like zero growth in the money supply, the Fed will consider action. Any policy decision is based on several factors, many of which are long-term, consistent with the Fed's stated willingness to forsake short-term economic booms to promote long-term stability.

Of the four main tools that the Fed has at its disposal - policy directives, Federal Funds Rate, M2 segment of the money supply, and total reserves held by banks - it tends to rely on two when an economic downturn threatens. The option that receives the most press attention is a lowering of the Federal Funds rate, the rate at which banks borrow funds from the Fed. Lowering this rate is intended to lower other interest rates and in turn spur lending, investment, and housing starts. Although the Fed cannot directly set interest rates, banks almost universally follow the Fed's lead as signaled by reductions in the Federal Funds rate.

The Fed cuts interest rates when the economy shows signs of decline. Lower rates decrease the cost of capital for businesses, thereby improving profit margins and encouraging expansion. Simultaneously, lower interest rates spur economic activity by encouraging consumer spending, particularly on mortgages. Finally, lower interest rates tend to have a positive effect on stock prices by improving the attractiveness in comparison to bonds and other fixed-income investments. In January 2001, the Fed cut interest rates by a full percentage point in an attempt to stave-off a recession. It was the biggest rate reduction in a single

month in Greenspan's 13-year tenure as Fed Chairman. The federal funds rate was reduced in June 2001, by one-quarter point to 3.75%. This is the lowest of short-term market interest rates because it is the rate that banks charge each other on overnight loans. The Fed sets this rate by buying or selling government securities until the target level is achieved.1

The Fed's second high profile option is to lower the reserve ratio, the percentage of holdings that banks are required to keep in their accounts. This action is intended to promote lending and investment. Again, the Fed cannot directly control the flow of funds out of banks and into the hands of consumers and businesses, but can make the lending environment more receptive to borrowers. Additionally, increasing the money supply creates the possibility for inflation.

The advisability of either of these options presumes that inflation is not causing the downturn. In inflationary situations, the actions taken would be opposite. For example, if the inflation rate is high, the Fed might raise the Federal Funds rate to tighten the money supply in an attempt to introduce price stability.

The Fed's Impact on Business Plans

As shown in the experiences of prior recessions, the actions of the Federal Reserve can have a great impact on the viability of business plans. Therefore, it is important for managers to observe and understand certain things about the Fed:

1.	The Fed has direct and indirect impacts on interest rates. If managers watch the Fed, they can better track the course of interest rates over the short term, which may help them to anticipate their future cost of capital.
2.	Fed actions affect currency exchange rates. In 1990, American banks lost capital to foreign banks, as investors moved funds out of the country to take advantage of higher interest rates overseas and in response to predictions of a weakening dollar. Over the succeeding months, evidence mounted that companies dependent on foreign investment had good

	reason to be concerned about the effects of Fed action on interest rates and the value of the US dollar.
3.	The composition of the Federal Reserve Board of Governors is critically important. Personalities played a strong role in the 1990-1991 recession. Alan Greenspan's independent attitude shaped and shapes many Fed's actions. As a result, the Fed continues to have keeping inflation in check as a priority to goal.

EMERGING FROM RECESSION

Government initiatives, Federal Reserve Board actions, and monetary policy all impact managers' decisions during economic recovery from a recession. The Federal Reserve Board cut interest rates 18 times in attempting to accelerate the recovery from the 1990-1991 recession. These low short-term interest rates made borrowing more attractive, and thus increased sales for manufacturers. For example, the automobile industry reached a strong annual rate of 7.5 million cars in June 1992 after Ford and General Motors reported combined losses in the first quarter of 1991 of more than $2 billion.

Simultaneously, low interest rates encouraged corporations to streamline their balance sheets by removing high debt payments and replacing them with lower payments. For example, in 1992, Carnival Cruise Lines called a zero-coupon convertible paying an interest rate of 7.5% and replaced it with some bank borrowing and a $100 million convertible paying 4.5% interest.

Ryder System, one of the nation's largest truck rental and leasing companies, took advantage of favorable interest rates prompted by the recession to reduce its debt by $1.2 billion between 1990 and 1992. By decreasing the debt on its balance sheet, Ryder managers could focus on the long-term and begin to determine the best future use of their companies' assets.

Managers should look for a valuable but initially counter intuitive government action to help business recover from a recession - the government may raise taxes on individuals and corporations. The impact of these taxes at first would appear to reduce consumer income, and thus lower business cash flows, but in reality, the opposite is true. When consumer spending is dampened, worries about inflation decrease along with the need to raise interest rates. Therefore, critically important long-term interest rates to businesses are kept low.

Businesses then begin to increase their capital spending, which over time generates more cash flow than would a slight, brief surge in consumer spending.

Managers' decisions during a recovery are also affected by the response of financial institutions to changes in interest rates. After recessions, many banks are extremely cautious about extending business loans. Opting for lower risk, they invest in default-free government securities. In 1992, commercial banks cut back on their commercial and industrial loans to businesses by $28 billion, while they invested more than $115 billion in US Treasury securities.

Managers must also be watchful for the tendency of financial institutions to slash the rate they pay depositors while scarcely lowering their lending rates to borrowers. Certificates of deposit that were paying 7.0% interest before the 1990-1991 recession were only paying about to 3.0% in 1992. Such actions by banks lead to a decrease in disposable income for those who depended on their savings. With lower discretionary funds, these consumers shied away from corporate stock investments.

GOVERNMENT ALWAYS PLAYS A ROLE

The actions of the Federal Government profoundly impact the formation, duration, and reversal of an economic downturn. While it is an overstatement to claim that the Government can mandate change, it is true that Government action exerts the single greatest influence on the speed and severity of the contraction stage of the business cycle. Therefore, as managers improve their ability to anticipate major Government actions, they simultaneously heightened their ability to implement altered business strategies that best position their firms to deal with the vagaries of a recession.

Managers who have thoroughly considered the impact of a recession and of the fiscal and monetary policy responses that the President, Congress and the Federal Reserve Board have available are better prepared to benefit from the opportunities that such policies and actions provide. Further, while responses to past recessions are only modest predictors of future actions, the general dynamics of recessions are clear. Thus, the advantage before, during, and after a recession goes to the action-oriented managers who understand the nature, motivation and likely consequences of government action.

NOTES

[1] An option that is occasionally mentioned involves lowering the discount rate. It was reduced on October 2, 2001, for the ninth time in nine months to 2.00%. The discount rate applies to loans made directly to commercial banks by the Federal Reserve. This rate is generally set one-half percentage point below the federal funds rate. It is not discussed more fully here, because the Fed rarely makes such loans, and thus the discount rate is considered largely symbolic.

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PERSONALITY TYPE, GENDER AND RISK: A FRAMING ANALYSIS

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ABSTRACT

Recent literature has explored the effect of personality type on economic education. This paper extends that literature by tying personality types and gender to individual decision making for issues involving risk and uncertainty. This study replicates findings that the framing of uncertain decisions, although a violation of strict expected utility theory, is a widespread phenomenon. Through reported personality measures, framing, gender, and personality types are linked. These finding demonstrate that both personality types and gender are important when considering the evaluation of decisions involving risk and uncertainty. Personality types, as well as gender, are found to yield significant differences in decision making both in terms of risk preference and framing. Since behavior is influenced by personality type and gender, then the concern for economic educators is that learning is also influenced.

INTRODUCTION

Risk preference and preference reversal, also known as framing, are significant factors for evaluating decisions involving risk and uncertainty. Behavioral studies have explored issues where the framing of questions involving insurance, gambling, and medical decisions influences perceptions. Experimental studies have documented that decision-makers react differently to the same proposition depending upon the manner in which it is presented. This phenomenon is known as preference reversal and violates a strict expected utility analysis of decision-making (Machina, 1987). A related question is which individuals are more likely than others to be prone to either risk avoidance or preference reversal? We explore this question by incorporating personality types and gender into an analysis of risk preference and preference reversal. It is the

purpose of this paper to explore the link between personality, gender, risk, and framing.

GENDER, PERSONALITY TYPE, AND DECISION MAKING

Gender is one of the most important independent variables that should be investigated when looking at risk and decision making (King & Hinson, 1994). Women communicate and make decision differently than men. Brown (1996) states that "gender begets gender roles" (p 243) and in decision making and risk situations, behaviors consistent with gender roles are most likely to be affected. One of the most evident manifestations of gender roles is in the risk women are willing to take in making decision. Recent Literature concludes that women have a lower preference for risk than men (Hyde, 1990; Powell & Ansic, 1997; Sonfield, Lussier, Corman, & KcKinney, 2001) but no differences in decision making values or styles (Powell, 1990). Women are, in general, more likely to choose the certain outcome.

Personality also plays a part in how decisions are made. Personality types have been linked to management and decision-making and are correlated with managerial responsibilities and occupations (Keirsey, 1998). One of the more common approaches to measure personality is the development of Myers-Briggs Type Indicators: Extravert or Introvert, Sensor or Intuitive, Thinker or Feeler, and Judger and Perceiver. Myers-Briggs Type Indicators, based on Jungian psychology type theory, is used as a framework to discuss personality types and their potential to influence decision making under risk and uncertainty. Myers and McCaulley (1989) explain each:

- *Extravert-Introvert index* (E or I) reflects how an individual relates to the world of people and things
- *Sensor-Intuitive index* (S or N) reflects how a person chooses to gather information or perceives the world
- *Thinker-Feeler index* (T or F) reflects how a person prefers to make judgments or decisions
- *Judger-Perceiver index* (J or P) reflects how a person prefers to deal with the world.

These eight letters and the traits they represent can be combined into sixteen possible combinations to further explain why people are different from each other.

Myers (1962) then partitions the sixteen types into four groups - SP, SJ, NF, and NT, suggesting that those in each grouping are very much alike in their attitudes and actions whereas those in other groups are very different. Keirsey (1998) describes the four groups:

- *SP*s are adaptable, artistic and athletic as well as very much aware of reality
- *SJ*s are conservative, stable, patient, dependable and hardworking
- *NF*s are humane, sympathetic, enthusiastic, creative and intuitive
- *NT*s are analytical, systematic, intellectual and inventive.

Being able to determine an individual's personality type gives some insight to how they will react in certain situations, how their temperament, character, and personality are configured, and how they are predisposed to certain actions and attitudes.

Personality types are related to learning and teaching styles. Borg and Shapiro (1996) extend the analysis into economic education and show that personality types also influence the success of individuals in the study and understanding of economic decision-making. A particular emphasis of their study asks not only which personality types may be best suited for studying economics, but considers the impact when the student and teacher personality types clash.

We extend the analysis to consider the influence of personality type on the underlying decision making practices that are covered as economic content. If the decision-making behavior under risk and uncertainty differs by personality type, then we should not be surprised to find that specific examples or pedagogical treatments of uncertainty are more easily understood and learned by some students than other. This paper specifically tests the hypothesis that risk preference and framing decisions are influenced by personality type.

THE USE OF FRAMING AND PREFERENCE REVERSAL

When the emotional context rather than the outcome influences managerial decisions, the issue of framing arises. For example, a reference point may influence the manager. The choice of reference point determines whether an uncertain choice is perceived as a gamble, (with a chance to win) or as insurance (where the certain choice limits loss) and influences the subject's decisions (Schoemaker & Kunreuther, 1979; Hershey & Schoemaker, 1980; McNail, Sox & Tversky, 1982; Slovic, Fischoff & Lichtenstein, 1983). To demonstrate this concept, alternate scenarios are presented with the same expected value outcomes. Tversky and Kahneman (1981, 1986) present the following classic decision for a life or death scenario:

> Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:
>
> If Program A is adopted, 200 people will be saved.
> If Program B is adopted, there is 1/3 probability that 600 people will be saved and 2/3 probability that no people will be saved.
>
> Versus
>
> If Program C is adopted, 400 people will die.
> If Program D is adopted, there is 1/3 probability that nobody will die and 2/3 probability that 600 people will die.

The outcome described as Program A is identical to that described as Program C. In each program there are 200 people who live and 400 people who die. Similarly the outcome described as Program B is identical to the outcome described as Program D. In each case with 1/3 probability 600 people live and with 2/3 probability 600 people die. If presented with saving lives through choices A and B, 72% choose the certain outcome A, however when phrased in terms of deaths 84% were willing to gamble on Program D.

METHODOLOGY FOR FRAMING AND PERSONALITY TYPE

Measuring the individual's personal preferences and disposition, a self-reporting instrument was used with dimensions that classify people using Myers-Briggs Type Indicator terminology. In addition, the survey instrument captured framing and relative risk preferences based on alternate scenarios of four uncertain decisions.

Four different questions were asked of each respondent to capture alternate framing environments. One question is presented as a straight monetary gamble; alternatively another question presents the same type of decision as an investment in the stock market. The life and death choice involving disease prevention strategies presented above was included as well as a final scenario where a decision on corporate restructuring involving job loss was presented. The questions alternated the frame of loss and gain so no respondent was asked solely questions framed as a loss or framed as a gain. The questions with each variation of answer are presented in Appendix 3.

Consistent with the methodology employed by Parker and Spears [8], the study was administered to a population of 249 students in business and economics courses. The respondents were administered one version of each of the four questions. The responses can be divided in groups to capture the set of questions administered In addition information was gathered for each respondent on their gender and reported personality type based upon the four Myers-Briggs types. Student surveys have traditionally been used in the framing literature with the results successfully replicated for other populations.

From the survey responses discrete measures were created for the variables. The dependent variables include: MONEY, with value equal 1 if the respondent chose the uncertain option for the money question; DEATH, with value equal 1 if the respondent chose the certain option for the life and death question; JOBS, with value equal 1 if the respondent chose the certain option for the corporate restructuring question; and STOCKS, with value equal 1 if the respondent chose the uncertain option for the stock question. In addition for each respondent, discreet personality variables were created identifying the four self reported personality indices, the Keirsey personality type, and GENDER. To capture the influence of the framing of the question another 0 or 1 variable, FRAME, was created identifying the form used. Cross variables were then created between FRAME and the personality and GENDER variables.

For each discrete dependent variable, MONEY, DEATH, JOBS, and STOCKS, the logistic probit procedure estimation technique is used to analyze the relationships. The probit procedure estimates the probability of the dependent variable by estimating the value of Z under a normal curve. The probability associated with an independent variable is calculated by evaluating the change in the Z statistic as the dependent variable is added.

The responses are coded as either 0 or 1. Similarly the variable FRAME is defined by coding the form with a 0 or 1 value identifies the version of the question posed. The constant term can be used to determine the probability that a respondent chooses the decision coded with a 1. The coefficient on FRAME can be used to identify whether a significant difference in answers is associated with using the alternate statement. When the coefficient on FRAME is significantly different from 0 framing has occurred.

The primary attributes to consider are the personality type indicators and gender. When the attribute is incorporated directly into the model the coefficient captures any difference in risk preference displayed. In order to illustrate differences in framing behavior the attribute is entered as a cross term with the form used. Since no a priori expectations were expressed as to which of the four personality type indices would be the most significant categorization, the attributes were included both directly to capture risk preferences and as cross terms to capture framing behavior using a stepwise regression procedure. The stepwise regression process adds variables in sequentially, including only those variables above a stated significance level.

RESULTS

The results from the series of estimations show that personality type and gender do play an important role in the forming of risk preferences and the framing of uncertain decisions. For three of the four questions posed at least one personality type index was significant either for framing or for revealing different degrees of risk preferences. In addition, there is a significant difference by gender in the risk preference for each question.

The results from the stepwise regression including the personality indices for each question are reported in Table 1. The intercept term captures the basic tendency to choose either the certain outcome or the gamble for each question; hence it is a measure of risk preference. The variable FRAME identifies the extent that the decision is altered by the manner in which the question is phrased.

For example in the first column, for the monetary question the estimate of the z statistic from the intercept term is -0.5444. Thus the probability of choosing to gamble by selecting the uncertain outcome is pr ($z < -0.5444$) = 29.31%. However when phrased in terms of a monetary loss the estimate of the z statistic is increased by a statistically significant 0.6065. Thus raises the probability that a respondent will select the uncertain outcome to 52.48%. Full calculations of the probabilities represented by the significant attributes in Table 1 are presented in Appendix 1. The only attribute that enters significantly in the money equation is GENDER. Females are significantly more risk averse than males and less likely to choose to gamble. In the absence of framing the probability for choosing the uncertain outcome is 29.31% for males compared to 18.72% for females. Given the framed question the probabilities rise to 52.48% for males versus 38.90% for females. For the money question, no significant difference is found for framing by gender, just the level of risk aversion. The question MONEY is the only example where none of the personality attributes entered as significant.

In column 2 of Table 1 the results for the estimation of the life and death scenario are presented. In this estimation GENDER not only reveals a difference in the risk preferences, but also is significant in the framing behavior. Females are significantly more likely to choose the certain outcome than males, but are significantly less susceptible to framing. The probability that a male will choose the certain outcome rises from 12.25% to 70.16% when framed as saving lives. However the probability that a female will choose the certain outcome starts at 37.66% and rises to 78.40%. This represents a significantly smaller shift in the z statistic. For the life and death question there is also a significant difference in the framing behavior captured by the judger perceiver index. A male perceiver is significantly less likely to choose the certain outcome based upon the frame. The probability of a male Perceiver choosing the certain outcome is 51.83% compared to the male Judger at 70.16%.

The results for the organizational behavior frame of job loss reported in column 3 gives results similar in direction to that of the life and death decision. Again GENDER captures the greater risk aversion of females and Perceivers are less likely to frame than Judgers. In this equation the only significant framing behavior is that identified on the Perceiver Judger index. The probability that a female Perceiver will choose the certain outcome is 72.51% but falls to 56.66% when framed as losing jobs. By comparison the male Judger only selects the certain outcome 39.95% of the time.

In the last column of Table 1 the monetary gamble is repeated within the context of the stock market. Here the coding of gain and loss are reversed. The intercept term identifies the probability of choosing to gamble as 63.34%. However when framed as a gain the likelihood of choosing to gamble declines to 27.91%. Females are again more risk averse choosing the uncertain outcome with a probability of only 49.32%. There is no significant difference in framing by GENDER. Two personality indices reveal differences in framing behavior. When the question is framed as a gain in the stock market, Intuitives are more likely to choose the uncertain outcome than Sensors, and Thinkers are more likely to choose the uncertain outcome than Feelers.

The results from the stepwise regression using the Keirsey Personality types are reported in Table 2. The personality types included were SP, NF, and NT with SJ as the excluded variable. As columns 1 and 3 reveal this categorization does not always reveal significant differences in risk preferences or framing behavior. For the MONEY equation the personality attributes were not selected and the results are identical to that in Table 1. For the jobs equation no significant framing is identified. The only significant variable is the relative risk aversion of females to males. The computations of the relevant probabilities are presented in Appendix 2.

TABLE 1
Probit Analysis of Framing by Personality Indicator

	Money	**Death**	**Jobs**	**Stock**
Intercept	-0.5444	-1.1628	-0.2547	0.4223
Standard Error	0.1575	0.2308	0.1604	0.1558
Wald Chi-Square	11.9435	25.3851	2.5212	7.3487
Pr> Chi-Square	0.0005	0.0001	0.1123	0.0067
Frame	0.6065	1.6919		-1.2288
Standard Error	0.1680	0.3290		0.2557
Wald Chi-Square	13.0240	26.4384		23.1023
Pr> Chi-Square	0.0003	0.0001		0.0001
Gender	-0.3440	0.8485	0.3445	-0.3247

TABLE 1
Probit Analysis of Framing by Personality Indicator

	Money	**Death**	**Jobs**	**Stock**
Standard Error	0.1705	0.2728	0.1668	0.1711
Wald Chi-Square	4.0703	9.6742	4.2643	3.6001
Pr> Chi-Square	0.0403	0.0019	0.0389	0.0578
Gender Frame		-0.5919		
Standard Error		0.3640		
Wald Chi-Square		2.6439		
Pr> Chi-Square		0.1040		
Perceiver			0.5082	
Standard Error			0.2015	
Wald Chi-Square			6.3606	
Pr> Chi-Square			0.0117	
Perceiver Frame		-0.5751	-0.4303	
Standard Error		0.2368	0.2287	
Wald Chi-Square		5.8997	3.5398	
Pr> Chi-Square		0.0151	0.0599	
Intuitive Frame				0.5897
Standard Error				0.2480
Wald Chi-Square				5.6513
Pr> Chi-Square				0.0174
Thinker Frame				0.3685
Standard Error				0.2466
Wald Chi-Square				2.2337
Pr> Chi-Square				0.1350
n	252	251	250	251

The life and death question continues to exhibit the greatest differences in response. The probability of choosing the certain outcome increases from 12.25% to 65.27% when the question is framed in terms of saving lives. For females risk aversion increases the probability of choosing the certain outcome to 37.66%, but a lesser degree of framing means that when framed in terms of saving lives this probability increases to 72.68%. The respondent most likely to choose the certain outcome is a female with the question framed as saving lives. However, the increase in the z statistic is attributable to a greater degree of risk aversion with a lesser degree of framing. The Sensor Perceiver personality type is much less likely to choose the certain outcome relative to the omitted category (Sensor Judgers). The probability of a female Sensor Perceiver choosing the certain outcome drops to 42.68%.

The last column of Table 2 shows the impact of personality on the choice selected for the stock market example. Like the examples with MONEY and DEATH this scenario reveals framing behavior for the population as a whole. The GENDER variable shows differences in risk preference with females more likely to choose the certain outcome. Two of the personality types show significant differences from the omitted category. Individuals who are Intuitive Feelers (NF) demonstrate a greater degree of risk taking behavior and are significantly more likely to prefer the uncertain outcome to the certain. When framed as a gain, individuals who are Intuitive Thinkers (NT) are significantly more likely to choose the uncertain solution. This contrasts with the rest of the population that tends to choose certainty when framed as a gain and uncertainty when framed as a loss.

TABLE 2
Probit Analysis of Framing by Personality Type

	Money	**Death**	**Jobs**	**Stock**
Intercept	-0.5444	-1.1628	-0.0784	0.3410
Standard Error	0.1575	0.2308	0.1281	0.1588
Wald Chi-Square	11.9435	25.3851	0.3749	4.6108
Pr> Chi-Square	0.0005	0.0001	0.5403	0.0318
Frame	0.6065	1.5554		-0.9264

TABLE 2
Probit Analysis of Framing by Personality Type

	Money	**Death**	**Jobs**	**Stock**
Standard Error	0.1680	0.3081		0.1803
Wald Chi-Square	13.0240	25.4809		26.3933
Pr> Chi-Square	0.0003	0.0001		0.0001
Gender	-0.3440	0.8485	0.2916	-0.3580
Standard Error	0.1705	0.2728	0.1636	0.1725
Wald Chi-Square	4.0703	9.6742	3.1768	4.3052
Pr> Chi-Square	0.0436	0.0019	0.0747	0.0380
Gender Frame		-0.6378		
Standard Error		0.3661		
Wald Chi-Square		3.0350		
Pr> Chi-Square		0.0815		
SP Frame		-0.7878		
Standard Error		0.3115		
Wald Chi-Square		6.3969		
Pr> Chi-Square		0.0114		
NF				0.3695
Standard Error				0.1899
Wald Chi-Square				3.7876
Pr> Chi-Square				0.0516
NT Frame				0.7796
Standard Error				0.3026
Wald Chi-Square				6.6377
Pr> Chi-Square				0.0100
n	252	251	250	251

CONCLUSION

This paper replicates findings that the framing of uncertain decisions is a widespread phenomenon and through reported personality measures provides linkages of framing and personality types. These results measure the importance of personality types when considering the evaluation of decisions involving risk and uncertainty. Personality types and gender are found to yield significant differences in decision making in terms of risk preference and framing.

The differences in decision making by personality type demonstrates the difficulties for the economic educator posed by the content examples when teaching decision making under uncertainty. A stock market example might seem like a current application that would be easily understood by most students. However for female students the perception may be colored by their increased risk aversion, for NF students the perception may be influenced by their risk loving choice. The NT students are less likely to frame in the direction of the rest of the class so may miss the example entirely. Alternatively if the instructor is a Perceiver, then an example using job loss may be appealing as a current example that would induce framing behavior. Unfortunately, that example does not connect with the decision making process of the other personality types. The traditional examples of a straight monetary decision or a life or death decision are the most universally understood across personality types and gender, but the economic educator needs to be aware that even here differences in risk preference and framing tendencies can influence the understanding of the content.

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APPENDIX 1

Money:

Probability of choosing to gamble: pr ($z < -0.5444$) = 29.31%,
Probability of choosing to gamble when framed as a loss:
pr ($z < -0.5444+0.6065$) = pr ($z < 0.0621$) = 52.48%,
Probability of choosing to gamble for a female: pr ($z < -0.5444 -0.3440$) = pr ($z < -0.8884$) = 18.72%,
Probability of choosing to gamble for a female when framed as a loss:
pr ($z < -0.5444 -0.3440+0.6065$) = pr ($z < -0.2819$) = 38.90%.

Death:

Probability of choosing the certain outcome: pr ($z < -1.1628$) = 12.25%,
Probability of choosing the certain outcome when framed as saving lives:
pr ($z < -1.1628 + 1.6919$) = pr ($z < 0.5291$) = 70.16%,

Probability of choosing the certain outcome for a female:
pr (z < -1.1628 +0.8485) = pr (z < -0.3143) = 37.66%,
Probability of choosing the certain outcome for a female when framed as saving lives:
pr (z < -1.1628 +0.8485+1.6919 -0.5919) = pr (z < 0.7857) = 78.40%,
Probability of choosing the certain outcome for a Perceiver when framed as saving lives:
pr (z < -1.1628 +1.6919 -0.5751) = pr (z < 0.0460) = 51.83%,
Probability of choosing the certain outcome for a female Perceiver when framed as saving lives:
pr (z < -1.1628 +0.8485+1.6919 -0.5919 -0.5751) = pr (z < 0.2106) = 58.34%.

Jobs:

Probability of choosing the certain outcome: pr (z < -0.2547) = 39.95%,
Probability of choosing the certain outcome for a female:
pr (z < -0.2547 +0.3445) = pr (z < 0.0898) = 53.58%,
Probability of choosing the certain outcome for a Perceiver:
pr (z < -0.2547 +0.5082) = pr (z < 0.2535) = 60.01%,
Probability of choosing the certain outcome for a female Perceiver: pr (z < -0.2547 +0.3445+0.5082) = pr (z < 0.5980) = 72.51%,
Probability of choosing the certain outcome for a Perceiver when framed as losing jobs:
pr (z < -0.2547 +0.5082 -0.4303) = pr (z < -0.1768) = 42.98%,
Probability of choosing the certain outcome for a female Perceiver when framed as losing jobs:
pr (z < -0.2547 +0.3445 +0.5082 -0.4303) = pr (z < 0.1677) = 56.66%.

Stock:

Probability of choosing to gamble: pr (z < 0.4223) = 66.36%,
Probability of choosing to gamble for a female: pr (z < 0.4223 -0.3247) = pr (z < 0.0976) = 53.89%,
Probability of choosing to gamble when framed as a gain:
pr (z < 0.4223 -1.2288) = pr (z < -0.8065) = 21.00%,
Probability of choosing to gamble for a female when framed as a gain:
pr (z < 0.4223 -0.3247 -1.2288) = pr (z < -1.1312) = 12.90%,
Probability of choosing to gamble for an Intuitive when framed as a gain:
pr (z < 0.4223 -1.2288 +0.5897) = pr (z < -0.2168) = 41.42%,
Probability of choosing to gamble for a female Intuitive when framed as a gain:
pr (z < 0.4223 -0.3247 -1.2288 +0.5897) = pr (z < -0.5415) = 29.41%,
Probability of choosing to gamble for a Thinker when framed as a gain:
pr (z < 0.4223 -1.2288 +0.3685) = pr (z < -0.4380) = 33.07%,
Probability of choosing to gamble for a female Thinker when framed as a gain:
pr (z < 0.4223 -0.3247 -1.2288 +0.3685) = pr (z < -0.7627) = 22.28%,
Probability of choosing to gamble for an Intuitive Thinker when framed as a gain:
pr (z < 0.4223 -1.2288 +0.5897 +0.3685) = pr (z < 0.1517) = 56.03%,
Probability of choosing to gamble for a female Intuitive Thinker when framed as a

gain:
pr (z < 0.4223 -0.3247 -1.2288 +0.5897 +0.3685) = pr (z < -0.1730) = 43.13%.

APPENDIX 2

Money:

Probability of choosing to gamble:
pr (z < -0.5444) = 29.31%,
Probability of choosing to gamble when framed as a loss:
pr (z < -0.5444+0.6065) = pr (z < 0.0621) = 52.48%,
Probability of choosing to gamble for a female:
pr (z < -0.5444 -0.3440) = pr (z < -0.8884) = 18.72%,
Probability of choosing to gamble for a female when framed as a loss:
pr (z < -0.5444 -0.3440+0.6065) = pr (z < -0.2819) = 38.90%.

Death:

Probability of choosing the certain outcome:
pr (z < -1.1628) = 12.25%,
Probability of choosing the certain outcome when framed as saving lives:
pr (z < -1.1628 + 1.5554) = pr (z < 0.3926) = 65.27%,
Probability of choosing the certain outcome for a female:
pr (z < -1.1628 +0.8485) = pr (z < -0.3143) = 37.66%,
Probability of choosing the certain outcome for a female when framed as saving lives:
pr (z < -1.1628 +0.8485+1.5554 -0.6378) = pr (z < 0.6033) = 72.68%,
Probability of choosing the certain outcome for an SP when framed as saving lives:
pr (z < -1.1628 +1.5554 -0.7878) = pr (z < -0.3952) = 34.63%,
Probability of choosing the certain outcome for a female SP when framed as saving lives:
pr (z < -1.1628 +0.8485+1.5554 -0.6378 -0.7878) = pr (z < -0.1845) = 42.68%.

Jobs:

Probability of choosing the certain outcome:
pr (z < -0.0784) = 46.88%,
Probability of choosing the certain outcome for a female:
pr (z < -0.0784 +0.2916) = pr (z < 0.2132) = 58.44%.

Stock:

Probability of choosing to gamble:
pr (z < 0.3410) = 63.34%,
Probability of choosing to gamble when framed as a gain:
pr (z < 0.3410 -0.9264) = pr (z < -0.5854) = 27.91%,
Probability of choosing to gamble for a female:

pr (z < 0.3410 -0.3580) = pr (z < -0.0170) = 49.32%,
Probability of choosing to gamble for a female when framed as a gain:
pr (z < 0.3410 -0.3580 -0.9264) = pr (z < -0.9434) = 17.27%.
Probability of choosing to gamble for a NF:
pr (z < 0.3410 +0.3695) = pr (z < 0.7105) = 76.13%,
Probability of choosing to gamble for a female NF:
pr (z < 0.3410 -0.3580 =.3695) = pr (z < 0.3525) = 63.78%,
Probability of choosing to gamble for an NT when framed as a gain:
pr (z < 0.3410 -0.9264 +0.7796) = pr (z < 0.1942) = 57.70%,
Probability of choosing to gamble for a female NT when framed as a gain:
pr (z < 0.3410 -0.3580 -0.9264 +0.7796) = pr (z < -0.1638) = 43.49%.

APPENDIX 3

Form A

1. In addition to whatever you own, you have been given $1,000. You are now asked to choose between:
   a. ½ : ½ chance of a gain of $1,000 or $0
   b. a sure gain of $500

2. Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:
   a. If program A is adopted 400 people will die.
   b. If program B is adopted, there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.

3. The manufacturing division of a US company is having problems competing in the global market. The company must decide how to reorganize this division of 12,000 U.S. workers. Two strategies have been proposed.
   a. If some operations are contracted overseas 4,000 jobs will be saved.
   b. With an internal reorganization of U.S. operations there is a 1/3 probability that all 12,000 jobs will be saved and a 2/3 probability that no jobs will be saved.

4. In addition to whatever you own, you have been given stock worth $10,000. Based on today's market value, you are now asked to choose between:
   a. ½: ½ chance of a loss of $5,000 or $0
   b. a sure loss of $2,500

FORM B

1. In addition to whatever you own, you have been given $2,000. You are now asked to choose between:
   a. ½ : ½ chance of a loss of $1,000 or $0
   b. a sure loss of $500

2. Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:
   a. If program A is adopted 200 people will be saved.
   b. If program B is adopted, there is 1/3 probability that 600 people will be

	saved, and 2/3 probability that no one will be saved.
3.	The manufacturing division of a US company is having problems competing in the global market. The company must decide how to reorganize this division of 12,000 U.S. workers. Two strategies have been proposed. a. If some operations are contracted overseas 8,000 jobs will be eliminated. b. With an internal reorganization of U.S. operations there is a 1/3 probability nobody will lose their jobs and a 2/3 probability that all 12,000 will be unemployed.
4.	In addition to whatever you own, you have been given stock worth $5,000. Based on today's market value, you are now asked to choose between: a. ½: ½ chance of a gain of $5,000 or $0 b. a sure gain of $2,500

A SURVEY OF DETERMINANTS OF US FOREIGN DIRECT INVESTMENT IN ASEAN-5 COUNTRIES

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ABSTRACT

Since the early 1980's, the flow of US Foreign Direct Investment (FDI) has been an important source of private external finance for developing nations, contributing to their growth and stability. Although it is difficult to predict the destination of US foreign investment abroad due to the multiplicity of factors that influence the decision, numerous studies have examined host country determinants and their relationship to US FDI. The most documented and studied determinants of US FDI include the size of the host country's economy, growth rate of GNP, exports from both the host country and the US, exchange rate fluctuations, and inflation rates in the host country.

The purpose of this paper is to examine seven hypothesis-driven determinants of US Foreign Direct Investment, based on literature studies, and apply these to five of the ASEAN countries to access the significance of each determinant. Statistical data obtained from the years 1985 through 1999 on the following countries; Thailand, Singapore, Malaysia, Philippines, and Indonesia (ASEAN-5) was used in the study. Data analysis used multiple regression analysis to test hypotheses regarding some of the determinants that may influence US FDI. Results from this study show that size of the host country's economy, the host country's total exports, US exports to the host country, inflation rate, exchange rate fluctuations, composite risk index (including political risk, economic risk, and financial risk), and the perception of corruption in the host country serve as a useful model for predicting US FDI in Indonesia, Malaysia, Singapore, and Thailand. Although a few of these indicators weakly correlated with US FDI in the Philippines, the overall model was not useful for this country.

LITERATURE REVIEW

The increase in US FDI in developing countries since the early 1980's has laid the foundation for expansion of international production by multinational corporations throughout the world. Although industrialized countries continue to attract the greatest proportion of US FDI, their share is beginning to erode, as developing countries are becoming increasingly attractive targets for investment (Mallampally and Sauvant 1999). As US FDI flows to developing countries continue to grow, the effort to determine the factors that influence these flows has become an increasingly attractive area of research.

The theoretical foundation for evaluating factors that influence the flow of US FDI into developing countries can be found in the sizable body of existing literature. The Eclectic Theory of International Production developed by John Dunning identifies three categories of determinants that multinational corporations (MNC) must perceive as advantages before directly investing in a foreign country; 1) location advantage, 2) ownership advantage, and 3) internalization advantage (1980). First, the host country must possess some locational advantage that will attract investors. This is usually determined in the availability of natural resources, market size or potential market size, and lower costs. Second, the investing corporation must have an ownership advantage over competitors in the host country. This is usually in the areas of technology, marketing, or financial resources. Third, there must be an internalization advantage that would persuade companies to chose FDI over other strategies such as licensing, franchising, or exporting (Yue 1996).

Location advantage determinants

Econometric studies examining a variety of countries indicate a strong positive correlation between FDI and the size of the market (usually measured by GDP) as well as other characteristics that would determine market size, such as average income levels and growth rates (Marr 1997). However, some low-income countries with large markets may fail to attract large FDI flows. Given the questionable circumstances of achieving adequate product sales in a low-income country, other economic and political determinants may have a greater impact on FDI decisions in this situation.

However, domestic market factors are less important in export-oriented corporations. The relative size of the export sector in a host country may be a significant determinant of US FDI in that region. The export sector reflects an openness of the host country's economy that may be attractive to US companies that manufacture goods for export (Marr 1997).

Ownership advantage determinants

There is strong evidence in the literature that supports the importance of ownership advantages in FDI. Many of the ownership advantage determinants are microeconomic in nature and include firm size and multinational experience. According to Chandprapalert, firm size seemed to be the most significant factor in establishing an ownership advantage (2000). The determination of this relationship can readily be explained by the fact that larger corporations have a greater ability to absorb losses than smaller firms, so they tend to invest overseas and are less sensitive to uncertainty effects.

Other studies have also established a relationship between a firm's multinational experience and the extent of FDI, although, in the case of Thailand, this relationship was shown not to be statistically significant (Chandprapalert 2000). The reason for this discrepancy may be that Thailand is seen as a opportunity gateway to other neighboring countries, including Mynamar and Indonesia, that have a potential market of more than 120 million customers.

Internalization determinants

Inflation rate instability can influence FDI inflows into a host country. High levels of continually rising inflation will discourage multinational companies from investing in a host country due to the volatility and instability of prices. In the case of Brazil, higher levels of FDI were attainable once the country controlled its inflation rate (Ogier 2000).

The rapid rise of FDI over the past few decades has heightened interest in the relationship between FDI flows and exchange rates (Tomlin 2000). Numerous studies have established the exchange rate level as a vital determinant of FDI, however, exchange rate volatility has also been shown to have a deterrent effect on FDI (Campa 1993). Foreign currency exchange rate volatility in part aggravated the Asian crisis, as many of these nations financed their infrastructure development with short-term foreign currency debt. Since that time, Asian

governments have targeted long-term FDI as a way to build infrastructure without incurring short-term foreign debt (Gavieta 2001).

The use and evaluation of political risk as a US FDI determinant remains unclear. When the host country possesses abundant resources, no further incentive may be required (Marr 1997). As long as a company is able to operate profitably without any undue risk to its capital and personnel, the threat of political risk is minimized and may not be a factor at all. However, the importance of political and social stability is clearly demonstrated in the case of the Philippines. Political instability in the 1970's and 1980's contributed to the country being by-passed by foreign investors at a time when FDI inflows to the region surged (Yue 1996). However, investors became increasingly interested in the Philippines in the mid 1990's as political and social stability returned to the country.

Corruption may determine a country's ability to attract foreign capital. In studies done by Wheeler and Mody, there was no significant correlation between the size of FDI and the host country's risk factor, which included corruption among other variables (1992). However, other studies have shown a negative correlation between corruption and FDI in some countries (Lambsdorff 1999). Overall, no consensus of the impact of corruption on FDI, either negatively or positively, has been shown. The impact is more likely country specific and weighed in conjunction with other FDI determinants.

FDI TRENDS IN ASEAN-5

Over the last two decades, ASEAN-5 economies have experienced sustained FDI inflows, although the magnitude of the inflow has changed over time. From the mid 1970's to mid 1980's, FDI increased moderately, but from 1986 FDI increased rapidly with figures in 1996 more than eight times that of 1986 (Fan 2000). This trend was seen throughout Asia in the 1990's, as FDI jumped well beyond levels recorded in any other developing regions (Encarnation 1995). This increase in FDI inflows primarily represents the relaxation policies of the ASEAN-5 countries pertaining to manufacturing activities and trade. Several of these countries, including Indonesia and Malaysia have abundant natural resources, such as oil and minerals. Singapore and Malaysia were able to attract FDI by their stable macroeconomic conditions, high quality infrastructure, and the availability of a skilled workforce (Fan 2000). The continued political

unrest in the Philippines during the 1980's has served as a major deterrent to FDI inflows.

The Asian financial crisis in 1997 severely affected the economies of the ASEAN-5 countries. Despite this, the FDI inflows into these countries as a whole continued to grow although individual country's FDI varied. Indonesia and the Philippines saw a fall in FDI, while Singapore and Thailand increased FDI. Malaysia maintained its previous level of FDI inflows. Overall, FDI showed greater stability during the Asian financial crisis than other forms of investment and capital inflows (Fan 2000).

The Asian financial crisis also provided an opportunity for Asia-Pacific nations to examine and implement regulatory and institutional reform to help avert further crisis. The reform improved the overall business environment from an FDI perspective (Thompson and Poon 2000) and fostered a more liberal attitude toward FDI. In general, all of the Southeast Asian governments perceive the potential benefits of FDI to outweigh the potential costs. The financial and non-financial contributions of FDI are increasingly recognized as important elements in a nation's economic development and long-term growth. Foreign investment benefits many of the Southeast Asian nations by introducing new skills and technologies, generating new jobs, creating linkages with domestic firms, and providing competition for lackluster domestic firms (Yue et al. 1999). These benefits add value that is more attractive than borrowing as a means to access foreign capital for development purposes, in addition to promoting greater stability in their economic foundation.

Selection of Determinants for Analysis

The factors evaluated in this analysis are listed below according to potential advantage categories, as described by Dunning (1980). Since ownership advantage is more of a microeconomic (firm-specific) issue, determinants from this category were not selected for testing of this model. FDI data from 1985 to 1999 was collected from the Department of Commerce-Bureau of Economic Analysis. Data used for the determinants was obtained from Key Indicators of Developing Asian and Pacific Countries 2000 Volume XXXI, Transparency International, and the International Country Risk Guide (ICRG).

Location Advantage Determinants

First, is the size of host country's economy (GNP/C)- as measured by GNP per capita in this study. FDI is positively influenced by this factor (Dunning 1980) and is expected to have a positive sign. This is considered a long-term strategic factor, as the size of the economy is not altered too quickly (Zurawicki 1997). Second, is the US exports to the same country (USex) -This factor has been shown to be strongly correlated with FDI to a specific country (Lin et al. 2001, Gross and Trevino 1996) and is expected to be positive. Third, is the total exports from a specific country (COex) - Most studies have focused on comparing outward FDI with the total exports of a specific country. Typically, a higher outward FDI is associated with lower exports, resulting in a negative relationship. However, other studies have shown that the correlation is positive as other (El-Ostra 1996).

Internalization Factors

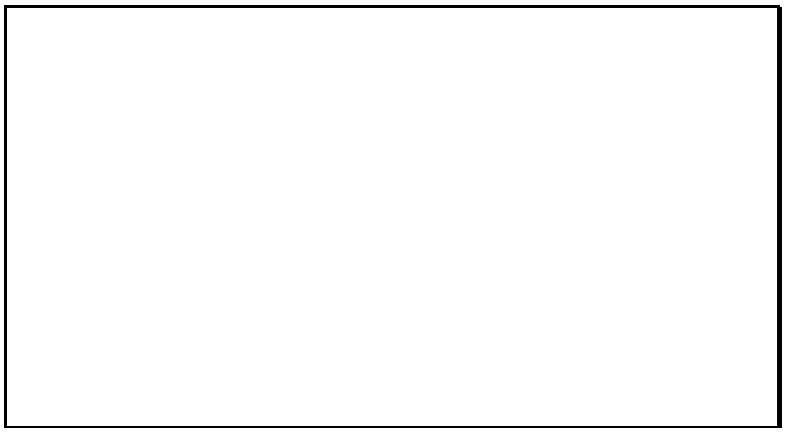
First, is the rate of inflation in host country (INFL) -This was shown to correlate negatively with FDI in previous studies (Schneider and Frey 1985) and would be expected to have a negative sign. Second, is the fluctuations in exchange rate (ER) - Lin et al showed that an appreciating exchange rate was an important determinant in the decision of a firm to invest overseas (2001). Fluctuations in exchange rate were important in influencing the volume of FDI in a particular country, but other factors relating to the structure of the economy could play a more significant role (Lin et al. 2001).

Third, is the composite risk index (CRI) - This index is based on the ICRG rating system of 0 to 100 with 50% based on political risk and 25% on financial and economic risk, respectively (Erb et al. 1996). This determinant may be expected to correlate negatively with FDI, in that a higher risk index number would potentially influence less FDI in a host country. The expected sign for this determinant is negative, however, this type of information is highly subjective and may not be applicable in some cases (Broadfoot 1998). Fourth, is the Corruption Perception Index (CPI) - (based on scale of 0 to 10 with 0 being highly corrupt and 10 being highly clean). The Internet Center for Corruption Research provides the Transparency Institutes Corruption Perception Index, a comparative assessment of a country's integrity performance. The CPI is a composite index that is determined using multiple sources compiled by the World Bank, Political & Economic Risk Consultancy, Institute for Management Development, IMD, Switzerland, PricewaterhouseCoopers, Economist Intelligence Unit, Freedom

House, and the World Economic Forum. This determinant would be expected to positively correlate with FDI since the lower number indicates high corruption and would be expected to lower FDI. Since there has been no consensus data on the correlation of CPI to FDI, this determinant is likely to be country specific and influenced be other determinants.

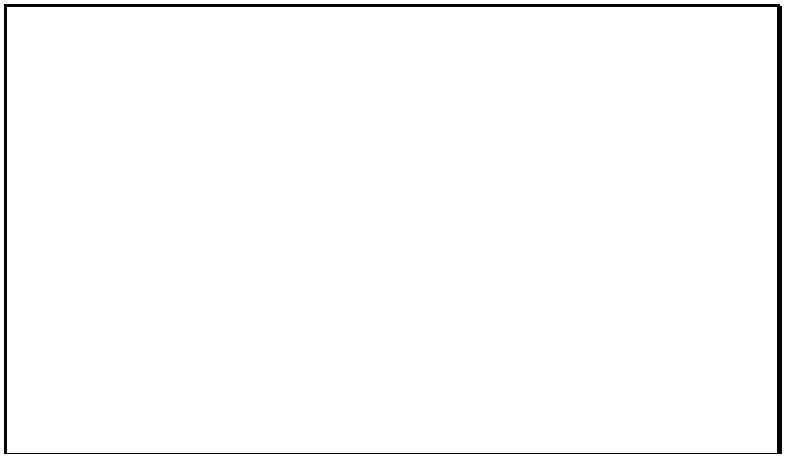
RESULTS AND ANALYSIS

As extensively discussed in the literature, US Foreign Direct Investment in the ASEAN-5 countries has been on the rise since the early 1980's. Figure 1 shows the total US FDI in the ASEAN-5 countries from 1985 to 1999. Figure 2 shows individual US FDI in each of the ASEAN-5 countries (Indonesia, Malaysia, the Philippines, Thailand, and Singapore). Most notable is the dramatic increase in US FDI in Singapore since 1990 compared to the other nations.



To examine the significance of each of the determinants, multiple regression analyses using the ordinary least square (OLS) was done. Equation 1 was used to test the hypothesis that GNP per capita, the host country's total exports, US exports to the host country, inflation rate, exchange rate fluctuations, composite risk index (including political risk, economic risk, and financial risk), and the perception of corruption in the host country have a significant effect on US FDI in Indonesia, Malaysia, Singapore, Thailand, and the Philippines. Table

1 provides the coefficients and their corresponding p-values (a =.05) for the testing period (1985 to 1999), as well as the R^2 value, F-statistics, and p-statistics



for each country in the model.

Equation 1:

$$FDI_{US}/GDP_{CO} = \_0 + \_1(GNP/C) \_\_\_2(US_{ex}) + \_3\_CO_{ex}) + \_\_4(INFL) + \_5(ER) + \_6(CRI) + \_7(CPI) + \_$$

Based on R^2 values, the model is a good fit for Indonesia, Malaysia, Singapore, and Thailand (see graphics Figure 3). This model is not a good predictor of determinants for US FDI in the Philippines. Only 45% of the variation in the model can be attributed to the determinants, based on R^2. Additionally, the p-statistic for this model is greater than alpha, which means that the model using these determinants in not useful in predicting US FDI in the Philippines. This finding is not entirely surprising as the Philippines has undergone significant socioeconomic turmoil throughout the 1980's and 1990's.

To evaluate the significance of each individual determinant to the overall contribution of the model, partial t-statistics were examined. Table 2 shows the partial t-statistics for each determinant in each country.

The average exchange rate was shown to be a significant determinant of US FDI in Malaysia and Thailand, while GNP per capita, US exports, inflation rate, and composite risk index were significant determinants of US FDI in

Thailand. Other individual determinants were not statistically significant based on partial t-statistics for the other countries in this model.

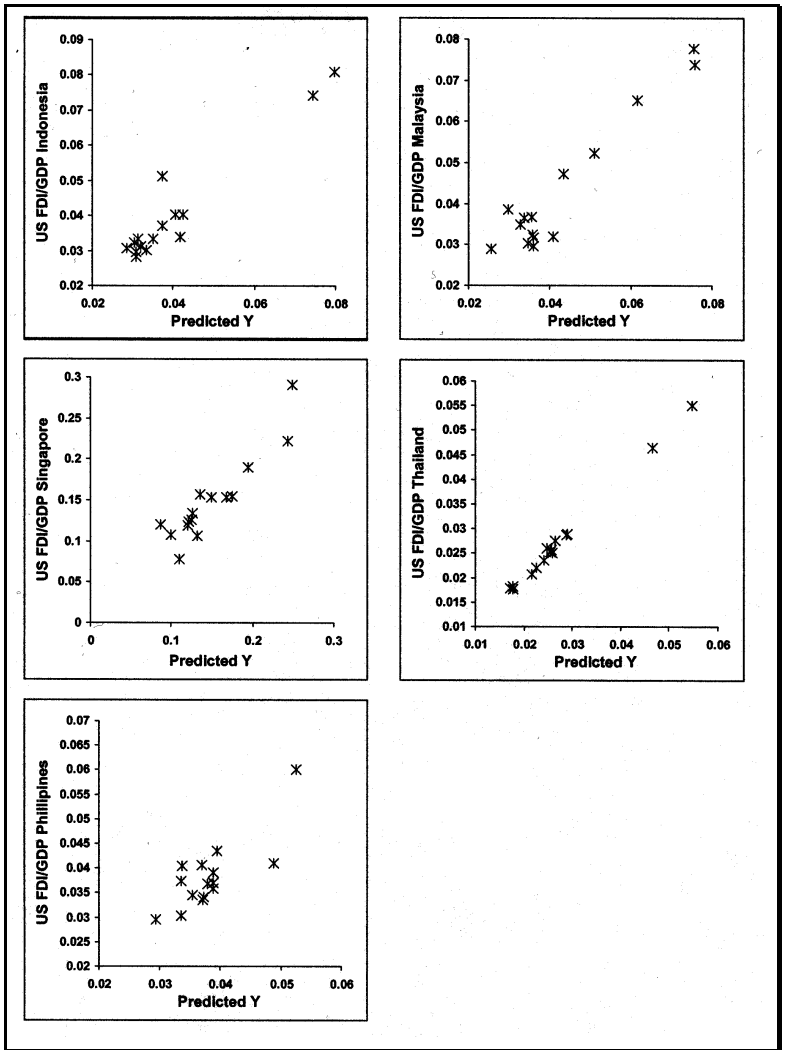
Table 1: Regression Analysis of the Determinants of US FDI in ASEAN-5 1985 to 1999 (p-values)

Coefficients	Indonesia	Malaysia	Singapore	Thailand	Philippines
$\_0$	0.0798	0.2731	0.1333	0.3111	0.1522
$\_1$	0.7395	0.2889	0.6175	0.0005	0.2045
$\_2$	0.2840	0.8645	0.4518	<0.0001	0.9071
$\_3$	0.8341	0.5866	0.7763	0.2454	0.8815
$\_4$	0.9336	0.2192	0.3315	0.0929	0.6199
$\_5$	0.9038	0.0409	0.1482	0.0005	0.9716
$\_6$	0.7328	0.4844	0.2131	0.0105	0.2057
$\_7$	0.3665	0.4186	0.4302	0.0003	0.7693
R^2	0.82	0.82	0.84	0.95	0.45
Adjusted R^2	0.74	0.74	0.58	0.89	0.19
F-Statistics	11.35	11.47	5.24	236.70	1.83
P-Statistics	0.0024	0.0023	0.0220	<0.0001	0.2216

Table 2: Regression Analysis of the Determinants of US FDI in ASEAN-5 1985 to 1999 (partial t-statistics)

Coefficients	Indonesia	Malaysia	Singapore	Thailand	Philippines
$\_0$	2.048124*	-1.18932	-1.6983	-1.09163	1.606562
$\_1$	-0.34597	1.147375	0.522342	5.987625*	-1.39892
$\_2$	-1.16015	0.177004	0.796668	-8.33801*	0.121028
$\_3$	0.217391	-0.56978	-0.29533	1.267851	0.154652
$\_4$	-0.08639	-1.34947	-1.04329	-1.94497*	0.518726

$\_5$	0.125371	2.500909*	1.624757	6.068079*	0.036918
$\_6$	0.355298	-0.73812	1.369542	-3.46199*	1.395042
$\_7$	0.965457	0.859416	0.837067	6.608829*	0.304915
* indicates significance at the 95% confidence level					



Since the overall model was determined to be useful (based on p values) and a good fit (based on R^2 values) for four countries, a correlation analysis was conducted to investigate which of the determinants correlated with US FDI. This analysis can provide additional information on the determinants that correlate with US FDI in these countries and may be useful for future studies and modeling. Table 3 shows the results of this analysis.

Table 3. Correlation Matrix of US FDI Determinants

	US FDI/GDP Indonesia	US FDI/GDP Malaysia	US FDI/GDP Singapore	US FDI/GDP Thailand	US FDI/GDP Philippines
US FDI/GDP	1.000	1.000	1.000	1.000	1.000
GNP/capita (converted to US $)	-0.439	0.489	0.692	0.200	0.168
US exports to country	-0.407	0.680	0.728	0.291	0.452
Total exports from country	0.346	0.757	0.716	0.569	0.548
Rate of inflation (change in CPI)	0.788	0.249	-0.341	-0.184	0.023
Exchange rate (average)	0.872	0.812	-0.464	0.893	0.595
Composite Risk Index	0.093	0.579	0.649	0.263	0.449
Corruption Perception Index	0.196	-0.205	0.154	0.740	0.419

In the case of Indonesia, GNP per capita and US export were weakly negatively correlated. Although this is an unexpected result, the reason for this may be that there is little relationship between the decisions of US multinational corporations to invest in Indonesia to the size of the market. Indonesia is rich in natural resources and this may be a more attractive determinant than the actual size of the market, especially if companies are more apt to export their goods from Indonesia. The rate of inflation and average exchange rate in Indonesia were strongly correlated with US FDI. Apart from the years surrounding the Asian crisis, the inflation rate in Indonesia has remained fairly stable at a moderate rate of 6 to 9%. The average rate of exchange has fluctuated greatly over this time period, consistent with other studies that found fluctuations in this determinant to correlate with US FDI. Composite risks and corruption were not found to correlate with US FDI in Indonesia.

In Malaysia, there was a weak correlation between GNP per capita and US FDI. As with Indonesia, the market size may not be a relevant factor compared to other determinants that may attract FDI. However, export from the US, total exports from Malaysia, and average exchange rates were shown to be strongly correlated to US FDI. Again, these factors have been shown to correlate with FDI in other studies. The composite risk index for Malaysia was only weakly correlated with FDI. Corruption perception index and rate of inflation showed no relationship to US FDI in this country.

GNP per capita, exports from the US to Singapore, total exports from Singapore, and composite risk index were correlated to US FDI in this country. Singapore is considered a wealthy nation with little political, economic, or financial risk by Asian standards, thus explaining the correlation in these determinants. Other determinants tested for this model showed no or little correlation with US FDI in Singapore.

In the case of Thailand, total exports from the country were weakly correlated with US FDI, while the average exchange rate and corruption index perception were strongly correlated. Again, other studies have shown that fluctuations in exchange rates are correlated with FDI. The corruption perception index for Thailand averaged between two and three for the period measured, indicating little perceived corruption in this country. It is likely that perceived lower governmental corruption may positively influence US FDI, however, in cases where a company can operate without great fear of foreign government intervention, the corruption perception may not be a valid determinant.

Of the seven determinants tested for the Philippines, only five showed a weak correlation to US FDI in the country. The average exchange rate showed the highest correlation with a value of .595. The second determinant with the highest correlation to US FDI in the Philippines was total exports from the Philippines with a value of .548. Other weakly correlated determinants included composite risk index, corruption perception index, and US exports to the Philippines. Surprisingly, GNP per capita showed no correlation with US FDI in the country.

SUMMARY AND CONCLUSIONS

This paper tested seven hypothesized determinants of US FDI in the ASEAN-5 countries (Indonesia, Malaysia, Singapore, Thailand, and the Philippines). These determinants included the size of the host country's

economy, the host country's total exports, US exports to the host country, inflation rate, exchange rate fluctuations, composite risk index (including political risk, economic risk, and financial risk), and the perception of corruption in the host country. This model was tested using ordinary least square (OLS) regression. Overall, the model was shown to be a good predictor of US FDI in Thailand, Singapore, Malaysia, and Indonesia. However, the model was not a good indicator of US FDI in the Philippines. To investigate further each of the determinants, a correlation matrix was performed. Surprisingly, GNP per capita (as used as a measure of the market size) was only weakly positively correlated with US FDI in Singapore and Malaysia. This may be an interesting finding, as these are the two wealthiest countries (based on GNP per capita) in this study. US exports were moderately correlated with US FDI in Singapore and Malaysia, while total exports from these countries were more strongly correlated. The rate of inflation only correlated with US FDI in Indonesia while the rate of currency exchange was strongly correlated with US FDI in Indonesia, Malaysia, Thailand, and to a lesser extent, Singapore. The Composite Risk Index for each country only weakly, if at all, correlated with US FDI in these countries. The same is true with the Corruption Perception Index, except in the case of Thailand, where a strong correlation was seen with US FDI.

As previously discussed, investigating the determinants of US FDI in developing countries can have multiple outcomes. The decision of US companies to invest abroad depends on many factors. This paper sought to test a few of the determinants for US FDI in the ASEAN-5 countries and although there is no consensus on the importance of the individual factors that make up the model, the overall results indicate that the model is useful for four of the five countries tested. Further studies should focus on the use of alternative determinants for measuring the size of the market, as well as other location and internal determinants.

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INFLATION, INTEREST RATE, AND EXCHANGE RATE: WHAT IS THE RELATIONSHIP?

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ABSTRACT

A test of IFE (International Fisher Effect) theory was conducted for eight selected industrialized countries namely: Canada, France, Germany, Japan, The Netherlands, Sweden, Switzerland, and the United Kingdom. Each of these countries was used interchangeably as the home country, and foreign country to investigate the direction of the effect. Applying regression analysis to historical exchange rates and interest differentials was developed in a simplified statistical test of IFE. While caution must be exercised in applying and interpreting the theory, this information is useful in international business, export opportunities and price competitiveness of foreign imports.

INTRODUCTION

The International Fisher Effect (IFE) theory is an important concept in the fields of economics and finance that links interest rates, inflation and exchange rates. Similar to the Purchasing Power Parity (PPP) theory, IFE attributes changes in exchange rate to interest rate differentials, rather than inflation rate differentials among countries. The two theories are closely related because of high correlation between interest and inflation rates. The IFE theory suggests that currency of any country with a relatively higher interest rate will depreciate because high nominal interest rates reflect expected inflation. Assuming that the real rate of return is the same across countries, differences in interest rates between countries may be attributed to differences in expected inflation rates.

One of the problems affecting consumers and the world economy is exchange rates fluctuations and interest rates disparities. Among others, exchange rates fluctuations can create inefficiency and distort world prices. Moreover, the long term profitability of investment, export opportunities and price

competitiveness imports are all impacted by long-term movements in exchange rates, hence international investors/companies usually have to pay very close attention to countries' inflation. International businesses engaging in foreign exchange transactions on daily basis could benefit by knowing some short-term foreign exchange movements.

LITERATURE REVIEW

This theory is very attractive because it focuses on the interest-exchange rates relationship. Does the interest rate differential actually help predict future currency movement? Available evidence is mixed as in the case of PPP theory. In the long-run, a relationship between interest rate differentials and subsequent changes in spot exchange rate seems to exist but with considerable deviations in the short run (Hill, 1997). The international Fisher effect is known not to be a good predictor of short-run changes in spot exchange rates (Cumby & Obstfeld, 1981).

Thomas (1985) conducted a test of the IFE theory by examining results of purchasing future contracts of currencies with higher interest rate that contained discounts (relative to the spot rate) and selling futures on currencies with low interest rate that contained premiums. Contrary to the IFE theory the study found that 57 percent of the transactions created by this strategy were profitable. The average gain was higher than the average loss. If the IFE theory holds, the high interest rate currencies should depreciate while the low interest rate currencies should appreciate, therefore yielding insignificant profits by the transactions.

A study by Madura and Nosari (1984) simulated a speculative strategy by borrowing currency with the lowest quoted interest rate and invested in the currency with the highest interest rate. After the loan repayment at the end of the investment period, it was found that the difference between return on the investment and the cost of borrowing (spread) was usually positive. This is in contrary to the IFE theory.

In a different but related study, Cheung et al. (1995) found more positive evidence for the support of the PPP hypothesis. Using reduced rank cointegration analysis, they found that the currency realignments of the European Monetary System (EMS) have been effective in maintaining PPP among its member countries. They attribute the difference in their findings to the statistical technique employed for the study.

In view of the above, it is the objective of this paper to examine the International Fisher Effect theory as relevant to some selected industrialized nations. The choice of the countries stem among others, the fact that the currencies of five of them make up the basket of the currencies of the Special Drawing Right (SDR); a reflection of the relative importance of those currencies in international trade and payments. Also the governments of the selected countries are less likely to intervene in the foreign exchange market in attempting to influence the values of their currencies. Analysis of the results will be made and suggestions offered where necessary.

METHODOLOGY AND DATA COLLECTION

Various secondary data were collected for the following countries: Canada, France, Germany, Japan, The Netherlands, Sweden, Switzerland, and the United Kingdom. The data include quarterly money market interest rates and percentage change in the exchange rates. The data range from the second quarter of 1972 to the fourth quarter of 1996. The data were obtained from various sources of International Financial Statistics, published by the International Monetary Fund (IMF).

Following Madura (1995), statistical tests of international Fisher effect among selected countries were conducted. Ordinary least squares regressions were run on the historical exchange rates and the nominal interest rate differential. The equations follow from the assumptions that the effective (exchange rate adjusted) return on a foreign bank deposit (or any money market security) is:

$$r = (1 + i_f)(1 + e_f) - 1 \qquad (1)$$

where i_f is the foreign interest rate, and e_f is the percentage change in the value of the foreign denominating the security. The equation (1) states that the actual or effective return on a foreign money market security depends on foreign interest rate (i_f), as well as the percent change in the value of foreign currency (e_f) denominating the security. Furthermore, the investors who invest in the money market at the home country is expected to receive the actual rate of return which is simply the interest rate offered on those securities. In accordance with the IFE the effective return on a home investment (i_h) should be on average equal to the

effective return on a foreign investment (r), $r = i_h$. Substituting equation (1) for r, the equation becomes:

$(1 + i_f)(1+ e_f) - 1 = i_h$	(2)
solving for e_f :	
$e_f = [(1 + i_h)/(1 + i_f)] - 1$	(3)

when $i_h > i_f$, e_f will be positive. This means that the foreign currency will appreciate when the home interest rate is greater than the foreign interest rate. Conversely when $i_h < i_f$, e_f will be negative. That is, the home currency will appreciate when the home interest rate is smaller than the foreign interest rate. It should be recalled that the difference in the nominal interest rate between countries is due to differences in expected inflation rates assuming that the real rate of return is equal across countries. It should also be recalled that the PPP theory suggests that the currency of a country with a higher inflation rate will depreciate by the amount of inflation differential. Therefore, the country with a higher interest rate will experience depreciation in the value of its currency by the amount of interest rate differential which will consequently negate any gains by investors who invested in the securities of that countries due to a higher interest rate. Eventually, the return on investment in respective countries will be similar. For a detailed information on derivation of this equation, see Madura (1995).

TEST FOR INTERNATIONAL FISHER EFFECT

To test for international Fisher effect, the percentage change in currency is regressed against the nominal interest rate differential among the selected countries. Thus, the regression equation is as follows:

$e_f = a_0 + a_1 [[(1 + i_h)/(1 + i_f)] - 1] + \mu$	(4)
where,	
a_0 = constant a_1 = slope coefficient, and	

μ = error term.

The hypothesized values of a_0 and a_1 are 0 and l.0, respectively, implying an equal offsetting average percentage change in the exchange rate for a given interest rate differential. Each coefficient is divided by its standard error. The level of significance is determined by the critical t-value from the table based on the number of observations and degrees of freedom (Gujarati, 1988).

To test the direction of Fisher effect, each country is used as home country and then foreign country respectively. This will make it possible to investigate if the International Fisher Effect is unidirectional or not.

RESULTS AND DISCUSSION

Table 1 provides the regression results for the International Fisher Effect. As shown in this table, the results are mixed. While the theory holds for some countries, it does not hold for others. In other words, for some countries, the coefficients imply that a given differential in nominal interest rates on the average is off-set by an equal percentage change in the exchange rates. For other countries, this may not be true.

TABLE 1
Regression Results of International Fisher Effect for Selected Countries

		Foreign Country							
		CAN	FR	GER	JAP	NETH	SW	SZ	UK
Home Country	CAN		-.0034[1]	.6818	1.862	-.6091	- .3960	1.760	-.9002
			(.6638)*	(.9847)	(.9079)	(.9130)	(.6268)	(1.178)	(0.670)
			-1.096[2]	.5023	-1.1737	0.3688	3.4447	-0.293	-4.0001
			(2.739)	(1.452)	(1.398)	(1.301)	(2.382)	(.652)	(3.164)
Home Country	FR	.0961		.9129	1.118	.53332	-.5849	.6499	-4.001
		(.234)		(1.227)	(1.062)	(.959)	(.6311)	(1.372)	(3.163)
		-1.895		.0058	.4154	.4497	2.6093	-.2023	-3.7759
		(.6317)		(1.945)	(1.606)	(1.22)	(1.997)	(.8167)	(1.383)

TABLE 1
Regression Results of International Fisher Effect for Selected Countries

		Foreign Country							
		CAN	FR	GER	JAP	NETH	SW	SZ	UK
Home Country	GER	-.4729	-.45421		.3851	.7271	-.1898	1.995	-2.0768
		(.258)	(1.2196)		(.664)	(.698)	(.7899)	(1.14)	(1.004)
		-.8319	-1.684		.8406	.7633	1.030	-1.107	-4.9407
		(.6317)	(3.485)		(1.708)	(1.402)	(1.842)	(1.460)	(2.504)
Home Country	JAP	-.4359	.0004	.9114		.770	.0100	1.4938	-2.5809
		(0.273)	(1.099)	(.7257)		(.7039)	(.7235)	(1.072)	(1.175)
		-.6182	-.1586	.0706		.0636	1.962	-.1847	-6.216
		(.072)	(1.061)	(1.889)		(1.047)	(1.575)	(1.090)	(3.051)
Home Country	NETH	-.5751	-.1736	.9255	1.4411		.0340	1.9408	-1.1343
		(.2694)	(1.063)	(.7254)	(.6701)		(.7614)	(.976)	(1.099)
		-1.283	-.7695	-.1581	-1.180		1.986	-.8042	-2.009
		(.7029)	(1.978)	(1.939)	(1.564)		(1.758)	(.7891)	(2.843)
Home Country	SW	-.2040	.0902	1.2327	1.260	(.9255)		2.5227	-.5435
		(.2312)	(.6584)	(1.060)	(.8169)	(.9255)		(1.409)	(.5941)
		-.7959	-1.512	-.5869	.1226	-.3788		-.865	-3.914
		(.4365)	(2.076)	(1.449)	(.8042)	(1.087)		(.8713)	(1.577)
Home Country	SZ	-.5826	2.157	1.7341	.4376	.972	2.133		-3.231
		(.4071)	(1.712)	(1.233)	(.8120)	(.7713)	(1.593)		(1.701)
		-.640	4.243	2.8177	.4117	.8456	5.2378		-5.226
		(.7742)	(3.179)	(3.467)	(1.902)	(1.455)	(2.970)		(3.032)
Home Country	UK	-.2567	-.1574	.0663	1.9213	.1723	-1.016	1.8177	
		(.277)	(.6966)	(1.139)	(1.150)	(.9522)	(.643)	(1.274)	
		-.1881	2.086	1.326	-.9573	.9285	4.4086	-.2855	
		(.964)	(2.490)	(1.387)	(1.542)	(1.014)	(1.706)	(.635)	

[1] Constant of the regression

TABLE 1
Regression Results of International Fisher Effect for Selected Countries

Foreign Country									
		CAN	FR	GER	JAP	NETH	SW	SZ	UK

^{2} Coefficient estimate of the regression
* In parentheses are the standard errors of the coefficient estimates

The coefficients obtained in table 1 must be tested to determine if the IFE theory holds or not. The statistical tests are described below (Madura, 1993, 22l):

(a) Test for $a_0 = 0$; $t = (a_0 - 0)/$ s.e. of a_0
(b) Test for $a_1 = 1$; $t = (a_1 - 1)/$ s.e. of a_1

Each regression coefficient is compared to its hypothesized value, divided by its standard error. The significance of the test is determined by the procedure described in the previous section. If either hypothesis is rejected, then IFE theory is refuted. The results of the test are presented in Table 2.

TABLE 2
Test of International Fisher Effect Theory Between Countries.

Foreign Country									
		CAN	FR	GER	JAP	NETH	SW	SZ	UK
Home Country	CAN		H	H	NH	H	H	H	H
	FR	NH		H	H	H	H	H	NH
	GER	NH	H		NH	H	H	H	NH
	JAP	NH	H	H		H	H	H	NH
	NETH	NH	H	H	H		H	NH	H
	SW	NH	H	H	H	H		NH	NH
	SZ	NH	H	H	H	H	H		NH
	UK	H	H	H	H	H	NH	NH	

H: Theory holds

NH: Theory does not hold

When Canada is used as the home country, the theory holds between Canada and the selected countries except Japan. When France is used as the home country, the theory holds between France and Germany, the Netherlands, Sweden, and Switzerland, but does not hold between France and Canada, and the United Kingdom. The theory holds between Germany and France, the Netherlands, Sweden, and Switzerland. However, it does not hold between Germany and Canada, Japan, and the United Kingdom. Between Japan and other countries, the theory holds except for Canada, and the United Kingdom. Between The Netherlands and the selected countries, the theory holds except for Canada and Switzerland. When Sweden is used as the home country, the theory holds between Sweden and France, Germany, The Netherlands, but it does not hold between Sweden and Canada, Switzerland, and the United Kingdom. While the theory holds between Switzerland and the selected countries, it does not hold with Canada and the United Kingdom. The theory holds between the United Kingdom and Canada, France, Germany, Japan, The Netherlands, but does not hold for the United Kingdom and Sweden, and Switzerland.

In most cases, the theory holds except for few instances. It is intriguing to note that the theory holds between Canada and all other countries except Japan, when Canada was used as the home country. However, when Canada was used as the foreign country, the theory only holds between United Kingdom and Canada. This suggests that the exchange rate adjustment may not be a reciprocal phenomenon. Other reasons are that the exchange rate may not fully offset the interest rate differential in some cases, while in other cases, the exchange rate may more than offset interest rate. However, the results balance out such that interest rate differentials are on the average offset by fluctuation in the exchange rate over time. This is in accordance with suggestion by Madura that the IFE theory does not suggest that the relationship will exist over each time period, but periodic investments that attempt to capitalize on the higher interest rate would achieve a similar yield on the average if they are simply made domestically and periodically.

Whether the test holds or not also depends on other factors, such as the period of time under study. While it may hold for certain period, it may not hold for another. Other limitation of the theory is that exchange rate determination is not affected primarily by inflation alone. There are other psychological factors, as opposed to macroeconomic fundamentals, that play important role in determining the likely future exchange rates. The bandwagon effects which are

difficult to predict should not be ignored (Allen & Taylor, 1990; Ito, 1990). Exchange rate is also influenced by the markets for exchange rate. It should also be noted that different functional forms or estimating techniques may produce different results.

SUMMARY

A test of international Fisher effect theory was conducted for eight selected industrialized nations namely: Canada, France, Germany, Japan, The Netherlands, Sweden, Switzerland, and the United Kingdom. Each of these countries was used interchangeably as the home country, and foreign country so as to investigate the direction of the parity. The results are mixed. While the theory holds for some countries, it does not hold for others. The theory holds when some countries were used as home country but was refuted when they were used as foreign countries. This suggests that there may be some impediments to foreign trade that may affect exchange rate adjustment apart from interest and inflation rates differentials. While caution must be exercised in applying or interpreting the theory, this information is useful in international business in terms of export opportunities and price competitiveness of foreign imports.

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AN ANALYSIS OF INCOME AND CONSUMPTION- BASED TAXATION

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ABSTRACT

An issue in state finance is always how to raise sufficient revenues to cover all the expenditures government is called on to make. This article utilizes a few simple analytical tools of economic analysis to aid in the choice of taxes to impose on citizens.

INTRODUCTION

Several states have recently raised their income tax rate while some have increased their taxes on such goods as alcoholic beverages and tobacco. It is almost certain that taxes will not go away. An issue in state finance is always how to raise sufficient revenues to cover all the expenditures government is called upon to make. It is hoped that the use of a few simple analytical tools of economic analysis can aid in an objective assessment of the question as to which taxes should be used to collect the revenue from the people.

It is the contention of this paper that indifference analysis can be used in a simple understandable way to show on very objective grounds that the income tax is preferable to excise taxes for collecting any given amount of revenue from a citizen of state. Indifference analysis involves taking different combinations of any two products which would provide the same level of satisfaction or utility. This is illustrated in Exhibit 1 in which a consumer's taste for cigarettes is displayed relative to personal disposable income. What is shown on any particular indifference curve are combinations of physical amount of one product and amounts of income that will be spent on all other alternative products (or saved), with every point along the curve showing one level of utility. Any combinations on a higher difference curve is preferable to any of those on a lower curve. Indifference means sliding back and fourth on any curve, and preference means moving northeast to higher levels of utility.

While the indifference curve shows the taste or choice preference of a person, a budget line shows the range of choice which a given budget permits a

person to afford, given a market price for the products purchased. This is also illustrated in Exhibit 1. If a person has $36,000 in personal disposable income, the choice of spending can range from spending the entire amount on a product to spending nothing on it. In reality it will be something like point A where 1,000 units are purchased at a per unit price of $2.80 for a total expenditure of $2,800, leaving $33,200 to be spent on other things or saved. Point A is, in effect, a consumer equilibrium for the product given income, price of product, and tastes.

With the above as background regarding our tool of analysis, this paper is now ready to come to grips with the question as to the effect of different types of taxes on a person's choice of products and level of want satisfaction that can be achieved with a given income level. The following assumptions are made: The pattern of indifference curves reflects the preferences of some typical person; this person has an annual personal disposable income of $36,000; the price of the product, cigarettes, is $2.80 cents per package; and just to avoid confusion, the assumption is made that there are no taxes initially on either income or cigarettes.

Our typical person can purchase anywhere along budget line X; and since his preferences are reflected by the indifference curve, he chooses point A where $2,800 is spent on cigarettes and $33,200 is spent on alternative things. Point A is the highest level of utility he can achieve given this income and price for cigarettes. If the government now imposes a 50 cents per package excise tax on cigarettes, this will shift the budget line to Y and the now $3.30 price will permit maximum possible purchase of 10,909 packages. The person is lowered in his consumer equilibrium to B where 900 packages are purchased at $3.30 each for a total expenditure of $2,970. This leaves $33,030 for other spending. Out of this $2,970, the tax portion is $450 (900 x 50 cents). If the person had purchased 900 packages prior to the imposition of the tax, the total expenditure would have been $2,520.

The question arises, what if the same amount of taxes, $450 were collected from his person as an income tax, leaving the price of cigarettes unchanged. This would mean $36,000 less $450, or $35,550 of after-tax income. This amount, along with the unchanged price of cigarettes, means that the budget line would be Z in Exhibit 1. Budget line Z enables the typical person to achieve consumer equilibrium at some point C, which represents more utility than B but less than A The effect of either type tax is to lower a person's utility from what it could be, but the excise tax lowers it more than does the income tax. This is because the income tax is a reduction of "general purchasing power," and the consumer can cut spending where he wants to. On the other hand, the excise tax

raises the price of one product relative to others and thereby distorts the pattern of spending by the consumer. Another way of saying this is that with the income tax there is only an income effect as it lowers our spendable income, but with the excise tax, there is this income effect as well as a substitution effect as we change our spending pattern.

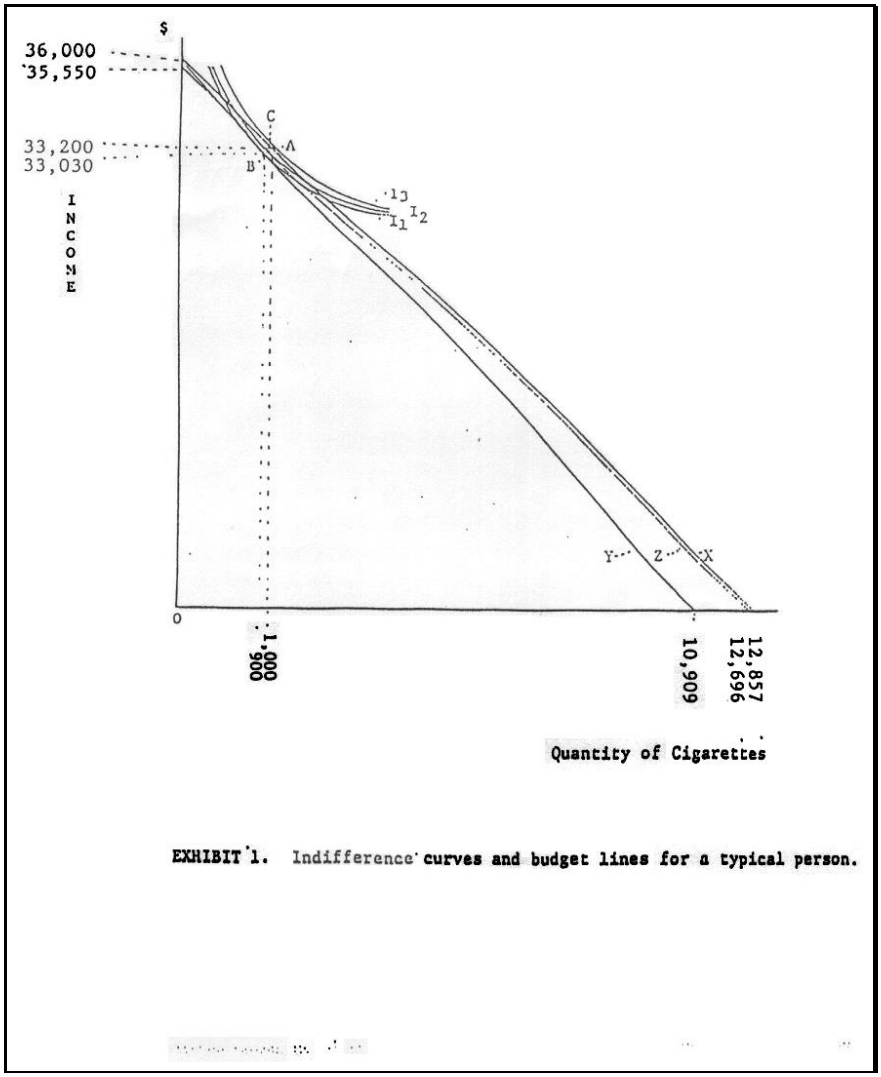

EXHIBIT 1. Indifference curves and budget lines for a typical person.

The usual argument against excise taxes has been that they relatively penalize lower income more than higher income persons. This argument is based on the contention that lower income people spend a larger portion of their income on the taxed items than do higher income people. With this analysis, excise taxes are seen to penalize each person regardless of income size due to their distortion of free choice of consumption. In conclusion, it can be argued that the free enterprise economy is enhanced by the use of tax systems that least distort the exercise of consumer sovereignty and freedom of choice. The analysis in this paper indicates that this occurs when income taxes rather than excise taxes are used.

It might be counter-argued that products like cigarettes should be discouraged due to their health effect. It has not been a purpose of this paper to deal with such health or value judgments. Instead of cigarettes, any other individual product could have been used for illustration purposes. It might also be argued that taxes on products like cigarettes might be justified if they are imposed on a seller. However, most studies of this matter indicate that the demand for cigarettes is relatively inelastic. It has been well established that the more inelastic demand is, the greater the incidence of a tax upon the consumer. Such taxes are not really a tax on consumers or a tax on producers, but a tax on the transactions between consumers and producers.

Exhibit 2 shows how the price paid by consumer and the price received by producers might change with a 50-cent excise tax. Who bears the burden of a tax depends on how the new equilibrium compares to the old equilibrium. The consumer's per unit burden is equal to the new equilibrium price. The producer's per unit burden is equal to the old equilibrium price less the price received by producers after paying the tax. Depending upon elasticities of demand and supply, the after tax equilibrium price outcome could vary. Consequently, the dollar amounts could vary in the previous analysis. The basic conclusion would remain valid though the dollar amounts could vary.

The final point to be evaluated in this paper is the equity of the principle of progressive income taxation. The issue is one of achieving equity in the distribution of the burden of taxation. It has already been argued that the income tax is, in principle, the fairest of taxes. If that is accepted as a starting premise, the issue then becomes whether the income tax rate structure should be progressive, proportional, or regressive. The usual definition is given of each of these terms

with progressive defined as higher tax rates applying to higher income tax bases, proportional being the same rate (flat rate?) applying to all income tax bases, and regressive defined as lower tax rates applying to higher tax bases.

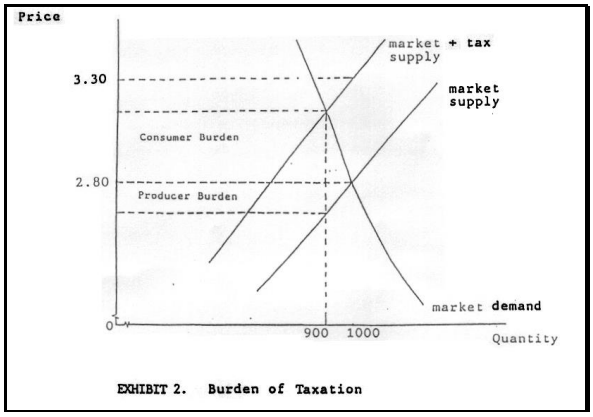

EXHIBIT 2. Burden of Taxation

The development of an objective and logical foundation or criteria for measuring equality of sacrifice is difficult. The argument put forth is that, ideally, taxpayers should make equal sacrifices in paying taxes out of their incomes. This does not necessarily mean equal payment of money by taxpayers at various income levels. Sacrifice is a subjective thing depending upon how fast the marginal utility of income diminishes. All of us individually have our own utility function and there is no accurate manner in which one person's utility can be added to that of other individuals. The argument put forth in this paper is that equity is achieved when the tax system results in an equal loss of utility by taxpayers.

Does the above infer the progressive income taxation is fairer? The answer is perhaps, but not necessarily. Exhibit 3 displays the variation of how marginal utility of income may diminish relative to money income. Each of these relationships would give us a different answer as follows:

Y demonstrates that MU declines at the same rate as money income rises, and calls for the use of proportional taxation. The

curve is a rectangular hyperbola.
X demonstrates that MU declines at a faster rate as money income rises, and calls for the use of progressive taxation.
Z demonstrates that MU declines at a slower rate as money income rises, and calls for the use of progressive taxation.

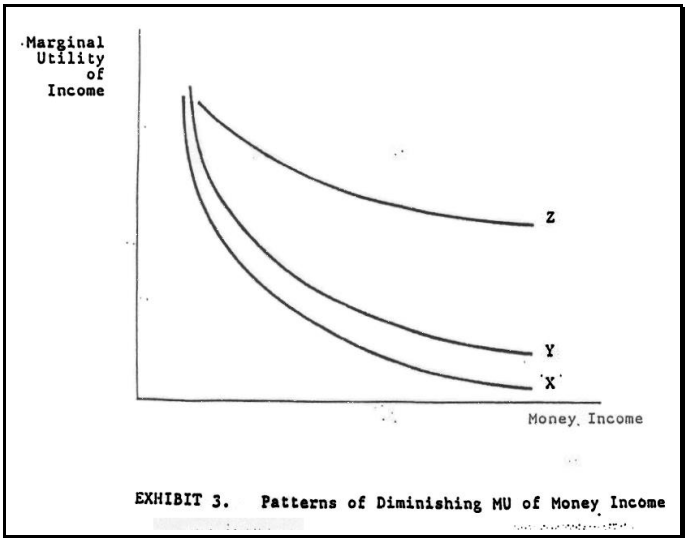

EXHIBIT 3. Patterns of Diminishing MU of Money Income

If we could just determine which of the three relationships is characteristic, we could solve the issue. If the situation is as curve Y displays, a person with an income of $100,000 and paying $10,000 would make the same subjective relative sacrifice as a person with $20,000 income and paying $2,000. This would assume that the MU of a $100,000 income is five times that of a $20,000 income and $100,000 times 1/5 equals $20,000 times 1.

On the other hand, if the curve is like X, marginal utility of income declines faster than the rate of change of income thus justifying progressive taxation. In this case the $100,000 income would have less than five times the marginal utility of the $20,000 income, and the amount collected as taxes would

need to be more than $10,000 to equal the subjective relative sacrifice made by the $20,000 income person who paid $2,000.

The purpose of this paper has not been to prove or disprove any tax propositions. Rather, it has been to make a few observations based on economic theory that offer some guidelines for thought as issues relative to taxation are explored.

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