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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 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 Academy is an affiliate of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world.

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.

Dr. Larry R. Dale

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ECONOMICS EDUCATION ARTICLES

USING AUTO RACING AS A MODEL TO TEACH ECONOMICS FOR GRADES K-12

Paula Buchanan, Jacksonville State University
Rebecca Hankins, Texas A&M University

ABSTRACT

The auto racing industry has grown to be one of the most popular forms of sports entertainment. In fact, The National Association for Stock Car Auto Racing's (NASCAR) Nextel Cup racing series is the fastest-growing spectator sport in the nation. Its television ratings are the second highest in major sports, with network coverage that attracts fans from all states and all walks of life. Economists have been researching the economic impact of sports on society for several years (Leeds, 2002; Fort, 2003). However, while many college-level books and journal articles on sports economics have been published (Downward & Dawson, 2000; Alexander, D.L., W. Kern, & J. Neill, 2000), there is no definitive curriculum available to teach sports economics to grades K-12. This article presents a model that uses auto racing to increase both teacher and student interest in, and knowledge of, economics. Auto racing provides a contextual framework in which real-world scenarios help students understand and apply basic economic concepts. The authors suggest that additional research should be conducted in the form of pre- and post-tests to determine the effectiveness of auto racing as a model to teach economics.

INTRODUCTION

In today's society, it has become more difficult for K-12 teachers to keep students focused on their studies. Comments from a presentation on this topic at the Allied Academies Spring 2006 Conference indicated that with distractions such as television, video games, and the Internet, students' attentions are often focused upon interests outside of the classroom. In addition, The No Child Left Behind mandates preparing students for standardized tests that take up even more of teachers' class

time. Many of these standardized tests focus on basic skills, in particular reading, math, science and English. Basic economic concepts are not usually included in this testing. In fact, "...educating...students in economics is not the norm; rather it is often ignored for many reasons, including a perceived lack of need for economic education, time constraints in the classroom, and inadequacy of teachers in the field" (Bethune & Ellis, 2000).

As a result, students often fail to learn such basic economic concepts as scarcity, supply and demand, and opportunity cost as effectively as they should. Ironically, many junior high and high school students are still taught home economics, but again, the economics portion is limited. The problem lies in that basic economics skills are not mandated, but are voluntary as laid out in the *Voluntary National Content Standards* in Economics. The 20 content standards described by the National Content Standards in Economics offer benchmarks for grades 4, 8, and 12. However, these standards are voluntary, leaving it up to individual states to decide how to incorporate economics into the school curriculum. For example, in the state of Alabama's "Standards and Benchmarks for Achieving Adequacy in Alabama Public Schools" economics is not listed at all. In the state of Texas, the curriculum for home economics for grades 7-8 is a module of thirteen sections under the heading Skills for Living, but only one section discusses anything related to economics.

Advocates for economic education face an additional two-pronged problem as a result of basic economic concepts not being an important component of K-12 teaching curricula. Many teachers have neither the basic skills nor time to effectively teach economics. Furthermore, economics is often viewed as one of the more difficult fields of study, and as a result is often avoided. Data from a recent survey of educators show that approximately fifty percent of elementary educators have no background in economics, and only twenty-five percent have had just one course in the subject. Therefore, most teachers interviewed in the survey said they experience a severe lack of confidence in their abilities to teach economics well (Schug, 1985).

LITERATURE REVIEW

In this article, the authors suggest a solution to the problem of teaching basic economic concepts in the classroom: introduce basic economic concepts to both teachers and students through auto racing. The auto racing industry has grown to be one of the most popular forms of entertainment. In fact, the National Association

for Stock Car Auto Racing's (NASCAR) Nextel Cup racing series is the fastest-growing spectator sport in the nation. Its popularity and credibility as a national event is recognized by politicians and celebrities. An article recently noted that former New York City Mayor and current Presidential candidate Rudy Giuliani's "recent stop to the Daytona International Speedway for the Pepsi 400 race...has become almost a requirement for politicians as they seek the all-important Southern vote. George W. Bush did it, John McCain attended a race six weeks ago, and even John Kerry professed to be a fan in 2004 (Gordon, 2007)." Given the popularity of this spectator sport, the authors believe that using an auto racing model to teach economics will enhance both teacher capability and student learning. Specifically, the popularity of auto racing ensures a "comfort level" for a subject that is often feared by both teachers and students.

Using sports models and metaphors to teach various topic areas, including economics, is not a new idea. Although there are a number of textbooks and journal articles that discuss various topics related to the economics of sports (Downward, 2000; Alexander, 2000), the authors could find no recent articles that use auto racing as a model to teach economics. However, the authors found one useful article that was written in 1999 by Steven Pinch and Nick Henry. This article analyzes the well-known economist Paul Krugman's theories, as they relate to the concept of economic geography. Economic geography is defined as the design and manufacture of racing cars in Britain. The article does offer some data that could be used to explain the content standards of marketing, the role of government, and money allocation. The article uses the British motor sport industry as an example of economic geography because "It is clustered in a 50 mile radius around Oxfordshire in southern England in what has been termed the 'Silicon Valley of Motor Sport' or 'Motor Sport Valley'... Thus, approximately three quarters of the world's single-seater racing cars are designed and assembled in this region and the vast majority of the most competitive Formula One, Championship Auto Racing Teams and Indy Racing League racing cars are designed and manufactured here" (Pinch & Henry, 1999).

A comparative study of British racing cars vs. NASCAR's American made cars, especially against current economic realities, could be used as a topic of discussion in the classroom. For example, a teacher's class could discuss the cost of dealing with foreign auto makers in terms of regulations; how the declining dollar value, when compared against the British pound, affects the cost of cars, and how these aforementioned factors affect the cost of tickets, purses, and investments. These examples demonstrate that the use of auto manufacturing, which is similar to

auto racing, can offer real-world concepts that can be tailored to students on multiple levels in order to assist them in learning basic economic concepts.

For this paper, the authors discuss how to use auto racing as a model to create lesson plans to address the National Council on Economic Education's *Voluntary National Content Standards* in Economics. Auto racing has a unique advantage over other sports in providing a model for teaching basic economic concepts to both K-12 students and their teachers, because it differs from other sports on the following points:

- ◆ Auto racing isn't a team-based sport, as only the car driver puts into action the efforts of the team;
- ◆ Auto racing drivers and vehicles can promote multiple sponsors at once; and
- ◆ Auto racing has one of the most brand-loyal fan bases in professional sports.

These aforementioned desired qualities of loyalty and market share have been noted by politicians and auto makers. In fact, Ford Motor Company has acknowledged that "its market share among NASCAR fans is five points higher than its share among the general public (Vettraino, 1999)."

The paper will present the following procedural steps utilized to create auto racing economics curriculum materials:

METHODOLOGY

The proposal discussed in this paper was presented at the Allied Academies Annual Conference in the Spring of 2006. The majority of the comments received during this presentation viewed the use of auto racing to teach economics as an innovative idea that would be effective in most of the country.

Other comments concerned the fact that even though the sport of auto racing has traditionally been popular in the rural south, it has developed a wider following over recent years. NASCAR has worked diligently to overcome stereotypes about racing to increase the number of fans who reside in urban and middle class neighborhoods. "If you think NASCAR is only for beer-swilling rowdies waving Confederate flags, you're out of date. NASCAR is mainstream entertainment. An average Winston Cup race draws more than 100,000 spectators, and nine of the 10 best-attended sports events in 1997 were NASCAR races (Vettraino, 1999)." NASCAR opened the Homestead-Miami Speedway in 1995, just 30 miles south of

Miami. In addition, many races have been moved to more urban locations such as Los Angeles, Chicago, and Las Vegas. From the aforementioned activities, it is apparent that the auto racing industry is already beginning to address this stereotype of the sport that was discussed during the constructive feedback stage of the Allied Academies Conference.

Given the constructive feedback provided at the Allied Academies Conference, the authors suggest utilizing the following steps in producing auto racing curriculum materials, which were outlined in the introduction section:

The *Voluntary National Content Standards in Economics*, which is published by the National Council on Economic Education (NCEE), provides a list of 20 content standards in economics. The first step in creating auto racing lesson plans involved a review of the National Council on Economic Education's *Voluntary National Content Standards in Economics*. This review was conducted to match each of the 20 basic economic content standards for grades K-12 to a relevant analogy from the sport of auto racing. Table 1 lists the results of this matching process.

Number	Content Standard	Auto Racing Analogy
1	Scarcity	Auto Racing Cars, Auto Racing Drivers, Corporate Sponsorships
2	Marginal Costs/Marginal Benefits	Adding extra driver or crew member to a team
3	Allocation of Goods and Services	Corporate Sponsorships-car makers, retail stores, restaurants, theme parks
4	Role of Incentives	“Purses” for Auto Racing Drivers
5	Gains from Trade	Championship Auto Racing Teams (CART) Inc., Constructors Championship, Drivers Championship, and Manufacturer Championship
6	Specialization and Trade	Proficient pit row crew
7	Markets-Price and Quantity Determination	Auto Racing Investment Cost vs. Benefits of Marketing
8	Role of Price in a Market System	Ticket Cost

Table 1–National Content Standards and Matching Auto Racing Analogies		
Number	Content Standard	Auto Racing Analogy
9	Benefits of Competition	Races and Placement Test Laps
10	Role of Economic Institutions	Advertising, production, and branding revenue
11	Role of Money	Fire suits (fire-resistant clothing required of all participants)
12	Role of Interest Rates	Market driven
13	Role of Resources in Determining Income	Investment opportunities
14	Profit and the Entrepreneur	Auto Racing Team Owners, Auto Racing Track Owners
15	Investment and Economic Growth	Fire suits
16	Role of Government	FIA NASCAR The National Association for Stock Car Auto Racing. and IMSA The International Motor Sports Association
17	Costs of Government Policies	Various racing governing policy
18	Circular Flow–Interdependence	TECH-technical inspection
19	Unemployment and Inflation	Ticket sales
20	Monetary and Fiscal Policy	Winston Million and Winston Cup

The next step is to write a lesson plan based on each of the 20 national content standards. Table 2 lists the proposed steps needed to develop each lesson plan. Scarcity, which is National Content Standard 1, is used as an example to illustrate the lesson plan development process.

Additional comments from the Allied Academies Conference included requests for a complete sample lesson plan. The authors will continue to work on the development of a sample lesson plan that will be included in further research conducted on this topic.

Section	Description
Content Standard	1, Scarcity
Lesson Plan Title	The Catbird Seat: The Scarcity of Race Car Drivers Objective(s) Understand alternatives and how to choose from them: training vs. professional Define and discuss the term scarcity as it relates to the lack of race car drivers Define and discuss the term opportunity cost- professional schools vs. sanctioning body schools
Vocabulary Covered	Alternative, choice, opportunity cost, scarcity
Time Required	60 minutes
Materials Needed	Internet access for students to compare schools
Lesson Plan Description	Each student will get to choose two schools, comparing cost and rewards. Give students time to conduct the activity, then discuss the results of the activity as a class.
Teaching Procedures	Distribute activity to each student Give students time to complete the activity Ask each student what choice they would make, given the alternatives, and why they made their choices Write the vocabulary terms on the board. Define and discuss each Provide concluding statements to end the activity
Evaluation/ Assessment	Conduct pre- and post-testing of students in the form of a quantitative, multiple choice questionnaire

EVALUATION AND ASSESSMENT

To evaluate the effectiveness of the curriculum materials, the authors suggest that the curriculum producers conduct a series of workshops in which the materials are presented to K-12 teachers. These workshops will address one of the major problems in teaching economics that was previously mentioned: teachers' lack of confidence in their abilities to teach economics. By giving K-12 teachers the opportunity to provide feedback and input on the materials that they will use to

teach economics, they will feel more comfortable with teaching basic economic concepts and principles. The use of pre- and post-testing of the teachers' satisfaction with teaching economics, which will provide a more quantitative evaluation of the curriculum materials, should also be conducted. The teacher evaluations will provide the feedback needed to revise the curriculum materials to make a final version. Once the final versions of the materials are made, the lesson plans will be available to teachers for use in the classroom. The lesson plans will include both pre- and post-tests for students. Again, conducting pre- and post-testing, of the students in this instance, will provide data needed in order to assess the benefits of using the auto racing materials to teach basic economic concepts.

CONCLUSION

Although auto racing is one of the most popular sports in the country, determining the effectiveness of this sport as a tool to teach basic economic concepts cannot be fully determined until the materials have been evaluated by the teachers who would actually use the materials. As was previously noted, ensuring that teachers have a theoretical understanding of basic economic concepts and principles is part of the challenge. The creation of workshops to instruct teachers in these concepts can be an opportunity for collaboration amongst secondary schools, institutions of higher education, and local community businesses.

The authors suggest using local branches of national nonprofits, such as Junior Achievement, to aid in the development and implementation of the auto racing lesson plans. Junior Achievement is the world's largest organization dedicated to educating students in grades K-12 about entrepreneurship, work readiness, and financial literacy through experiential, hands-on programs. Teachers could also use the resources of Jump\$Start (a coalition for personal financial literacy for K-12 students) and BestPrep (a nonprofit collaboration of volunteers from business, labor, education, government and social services) to provide technical assistance. The Foundation for Teaching Economics also provides assistance with lesson plans and curriculum development for teachers.

In order to develop productive outcome measurements, the authors suggest conducting procedural, assessment, and evaluation methods outlined in this paper to determine the effectiveness of this innovative teaching tool. The NCEE content standards, when paired with auto racing analogies provided in this paper, provide a foundational guide for the development of a curriculum and corresponding lesson plans. As with any effective outcomes-based measurement, evaluating the

effectiveness of the lesson plans by using pre- and post-testing is important. The authors suggest that, with the proper funding, these aforementioned resources can help both K-12 students and their teachers to become economically literate, and to view the popular sport of auto racing from a more informed perspective.

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FACTORS AFFECTING ECONOMIC LITERACY OF COLLEGE STUDENTS: SOME ADDITIONAL EVIDENCE

**Calvin Shipley, Henderson State University
Shekar Shetty, Salisbury University**

ABSTRACT

The evidence regarding the impact of the high school economics class on a student's success in the college principles class is mixed. This study reviews the results of earlier studies and investigates the impact of previous training in economics on the students' knowledge at the beginning and end of the principles course. The current study concludes that high school training has no significant impact.

INTRODUCTION

It is believed that college students who take principles of economics may have some difficulty in understanding the economics concepts taught in this course. The question then is whether previous exposure to economic courses has any influence on performance and the likelihood of students' success in the basic economics courses they take at the college level. Previous research indicates that there are conflicting results regarding the impact of prior knowledge of economics, particularly high school economics classes, on student performance in college level economics classes. Some studies report that students do not benefit much in their performance in college economics course by taking economics class at high school level. Other studies suggest that prior economics courses in high school help them in understanding the college economics courses.

For example, Palmer, Carliner, and Romer's study (1979) indicate that college students who took an economic course in high school did not begin their introductory economics course with significantly more knowledge, nor did they learn significantly more during the semester. These students actually received

significantly lower grades in the principles course than did those who had not taken high school economics. Reid (1983) also found that students who had high school economics achieved significantly lower grades in introductory economics than those without the high school course.

On the other hand, Becker, Greene, and Rosen (1990) believe that high school economics help the students better understand economics in college based on pre/post-testing. However, the authors were doubtful about its lasting effect on the students. Myatt and Waddell (1990) report that the high school economics course is found to be significantly positively correlated with students' grades in principles of economics in college. A more recent study by Lopus (1997), using a large nationwide database, found that students who had exposure to macro or microeconomics in high school were better prepared to take principles of economics classes than those with no high school economics background.

In addition, Dale and Allen (1999) found no significant difference in basic economic knowledge (as measured by the National Council on Economic Education's Test of Economic Literacy) between a group of elementary education majors and students enrolled in microeconomic principles. This was found to be true even though there are some differences in the methodology and content of these two courses. In addition, one might expect differences based upon differences in other college coursework due to the requirements of the different major. Dale and Allen also found that previous coursework in economics, but not in other business disciplines, had a very significant positive affect on economic literacy, as measured by the TEL. However, it was not clear whether this included coverage of economics prior to college in grades K-12.

The purpose of this study is to gather additional evidence to help clarify the conflicting results of earlier research by analyzing the impact of various levels of prior economic training and students' majors on their understanding of basic economic concepts.

RESEARCH AND ANALYSIS

During the spring 1997 through fall 1998 semesters, the Test of Economic Literacy was administered to sections of Economics for Elementary Teachers, Microeconomics and Macroeconomics Principles at Henderson State University. Students enrolled in Economics for Elementary Teachers are typically juniors majoring in elementary education. Students in the sophomore economics principles

classes are primarily business majors but include some secondary education (for social science certification) and liberal arts majors.

One purpose of the study was to determine what differences in test scores, if any, exist between the two types of students. To ease students concerns that this testing would impact their class grades, individual scores were not identified by student; therefore a paired t- test on individual improvement was not possible. However, an independent-samples t-test found no statistically significant difference between the two groups on pre-test or posttest scores. This indicates that there is no difference in basic economic knowledge, as measured by the Test of Economic Literacy, between elementary education majors and a group made up primarily of business majors, but also including some secondary education and liberal arts majors. When each of the groups was tested to see if there was an improvement in scores (post-test versus pre-test), no significant improvement can be concluded for either group. However, a t- test comparing all pre-test scores against post-test scores, all students combined, did show a significant improvement. The mean pre-test score was 26.30; the mean post-test score was 28.17. While the mean improvement as only 1.87 points, the larger sample sizes (366 took the pre-test and 304 took the post-test) allow the conclusion that improvement was statistically significant (probability of error is 3%). As stated earlier, to maintain student anonymity, pre-test and post-test scores were not paired, so no analysis of individual improvement was possible.

Another issue of concern was whether or not a student's previous education in economics had an impact on pre-test or post-test scores. Students were asked to indicate which of the following categories best described their background at the beginning of the semester in which testing was conducted.

1. Only had a high school economics course (at least one semester)
2. Had one high school course AND one college course
3. No high school course AND one college course
4. Two or more college courses
5. No high school or college courses

Sample results for pre-test scores are given in the table below.

Economics Background	Sample Size	Mean Pre-test Score
One high school course	35	25.46
No previous courses	250	25.71
No high school and on college	64	28.08
One high school and one college course	10	29.20
Two or more college courses	5	32.60

Basic one-way analysis of variance is based on assumptions of normality and equal variance for each treatment. An examination of the treatment distributions and Levene's test of homogeneity indicates that all treatment distributions are not normal nor are variances equal. However, analysis of variance is not appreciably affected if lack of normality is not extreme (Neter, Wasserman, Kutner, 1985, 624).

A one-way analysis of variance was conducted on the difference in pre-test scores by background. The F-test indicated a significant difference. Because treatment variances were unequal, Tukey's test of multiple comparisons was used to determine which treatment means were different. The only significant difference in pre-test scores was between the no high school/one college course group and the group with no previous coursework (several other multiple comparison tests based on unequal variances all produced the same results). Because the departure from normality might be large enough to affect the results of the analysis of variance, the nonparametric Kruskal-Wallis test was applied to the pre-test scores of the five groups. This test showed very significant differences in the five groups. However, this test does not permit determination of whether the mean, variance or skewness of the group is different (Neter, Wasserman, Kutner, 1985, 640).

To complete the analysis of differences in scores, two groups (one high school/one college course and two or more college courses) were dropped due to small sample size (10 and 5 observations). The remaining three groups were compared using the independent sample t-test. No significant difference in pre-test scores was found between those students who had at least one semester of economics in high school and those students who had no economics at all. However, the pre-test scores of students who have no high school but one college economics course were significantly higher than students with only a high school course or no economics at all. These results imply that high school training has no

impact on pre-test scores. Whether this is due to the high school course content or merely the length of the time that has passed since the high school course was taken cannot be determined from this data. It is also of note that the Krushal-Wallis test on post-test scores indicated no significant difference among the five groups.

SUMMARY AND CONCLUSION

The results confirm earlier findings of Palmer, Carliner, and Romer's study (1979), that college students with at least one semester of high school economics do not perform significantly better than those without any economics background when tested on basic economic concepts. Further research is necessary to determine whether the length of time, which has passed since the high school course was taken, has an effect on this conclusion. In addition, some public schools had adopted a curriculum, which integrates economic concepts across disciplines and is introduced beginning at the kindergarten level. Research to determine whether such an approach, either independently or in conjunction with a formal high school economics course, has an effect on a college student's understanding of basic economic concepts is needed.

Another area for further investigation is the impact of a student's major in test performance. While elementary education majors are clearly delineated in the study, no data was gathered to separate business majors from other majors in the principles of economics classes. A third and final area for expansion of this study should focus on the split between macroeconomics and microeconomics, and also whether the weight given to this decision on the Test of Economics Literacy might impact test performance.

In conclusion, these results add to the evidence on factors that affect college students' economic understanding, but further research is necessary to identify the key factors involved. As knowledge of these factors expands, curriculum improvements can be developed for public schools and college economics professors can better serve students in their principles classes.

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PEAKONOMICS: TOWARD A CASE TYPOLOGY FOR INCREASING UNDERGRADUATE ECONOMICS LITERACY AND CONCEPT RETENTION

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ABSTRACT

*This paper hypothesizes there is a legitimate enhanced role in undergraduate economics curricula for study examples modeled from the popular book *Freakonomics* Levitt and Dubner (2005). The following research question is posed: Can popular *Freakonomics* style economic case examples increase average student retention of basic economics principles? Selected *Freakonomics* case examples are compared with leading contemporary economics texts to reveal similarities in the economic concepts they demonstrate. An economics case typology named *Peakonomics* is then presented to establish face validity towards a case typology that can be further researched quantitatively. This line of inquiry warrants a rigorous analysis and academic dialogue in part due to a recent adoption pattern of *Freakonomics* in many universities in economics and non-economics classes.*

INTRODUCTION

This paper hypothesizes there is a legitimate enhanced role in undergraduate economics curricula for examples modeled from the popular book *Freakonomics* Levitt and Dubner (2005). The following research question is posed: Can popular *Freakonomics* style economic case examples increase average student retention of basic economics principles? Selected *Freakonomics* case examples are compared with leading contemporary economics texts to reveal similarities in the economic concepts they demonstrate. An economics case typology named *Peakonomics* is then presented to build face validity for quantitative research answering the posed question. This line of inquiry warrants a rigorous analysis and academic dialogue

in part due to a recent adoption pattern of *Freakonomics* in many prestigious universities in both economics and non-economics classes.

Freakonomics has experienced a recent adoption pattern in comprehensive universities in both economics and non-economics classes. Examples include Senior Honors Thesis Seminar at Berkeley, Public Policy Analysis at Georgetown, International Business at American University and Public Service Management at NYU. The initial publishing of *Freakonomics* was primarily novelty recreational reading for serious economics scholars. By contrast public interest in *Freakonomics* is overwhelming. Since its inception Levitt and Dubner's work sustained a position for 98 weeks on the *New York Times* best-seller list dropping to 17th place in mid April of 2007.

The topic is also timely because of a trend toward a simplified and more natural approach in the presentation of the best selling introductory economics texts.

Hansen et al (2002) observed that undergraduate students who had previously completed an introductory economics course did not understand basic economic concepts better than students who had no formal economics education. Within a few years many texts responded with an increased focus on the most important concepts further supported by the use of updated and practical demonstrative case examples. This simplified approach to explaining basic economics concepts to university students is described in part with phrases including: "thinking like an economist" Mankiw (2007), having "an economic perspective" McConnell and Brue (2006), and being an "economic naturalist" Frank and Bernanke (2007).

Additionally, there is a large body of literature supporting intrinsic motivators as a key factor in student ability to learn a subject. Examples include Feldman's (1989) finding that in addition to course organization and presentational clarity, the most important factors for learning were relevance of subject, stimulation of interest, and encouragement of discussion with peers. Fitzpatrick, McConnell and Sasse (2006) argue that it is paramount that students believe they are capable of using/applying the material beyond the classroom setting for it to be meaningful. According to Hodgkin and Marchesini (2003) most theorists studying efficacy in teaching appear to accept social persuasion as one of the top four efficacy determinant parameters. The typology advanced in this paper defines economics cases with strong potential to elicit student motivation in economics and improve teacher efficacy.

Although not intended as an academic text, *Freakonomics* is essentially a collection of cases demonstrating contemporary examples of a natural approach to economics concepts. The main difference between the *Freakonomics* case examples

and contemporary text case examples is the latter are not typically socioeconomic in nature. *Freakonomics* examples often address socioeconomic situations which violate a normative standard involving real life situations. One may argue that *Freakonomics* has no presentation of the analysis behind the case presentation, however it should be noted that student study guides are now available for free on-line at <http://www.freakonomics.com/studyguide/>.

Our hypothesis that *Freakonomics* style cases will improve student retention is based on the emotional intrigue of the general public to the violations to normative standards within the *Freakonomics* examples. It therefore follows that the typical student's interest and retention of economics concepts should be improved by including more *Freakonomics* style cases in the undergraduate introductory economics course plan and/or text. The linkage between performance in economics courses and student interest level is not new. Dynan and Rouse (1997) argue that women do less well in economics courses relative to their other courses possibly because of differing tastes or information about the nature of economics. Borg and Shapiro researched the relationship between students' personality types using the Myers- Briggs Personality Type Indicator and their performance in introductory economics. They suggest that "improving instruction in the introductory economics course by offering a variety of different teaching and grading strategies will better accommodate our students' diverse personality types and learning styles" Borg and Shapiro (1996). Since the Levitt and Dubner style examples are popular and already gaining some ground in academia, then *Freakonomics* cases make an excellent subject for more rigorous analysis of the hypothesis and proposed research question presented herein.

Based on our arguments and stated research question above we developed a comparative summary Table 2 (below) of both the Mankiw and Frank and Bernanke text approach. This summary is the basis for a brief review comparing and contrasting extant text principles to selected examples in *Freakonomics* and supporting our argument that this case style relates to the current instruction of introductory undergraduate economics curricula. Following the review a new typology is proposed with the intention of building face validity and ultimately construct validity in subsequent quantitative analysis.

A survey of the Palmer and Carlson (2006) *Freakonomics* study guide reveals the Frank and Bernanke *Incentive Principle* and the corresponding Mankiw *Principle 4: People Respond to Incentives* are both supported by case studies in Chapter 1 of *Freakonomics*. One *Freakonomics* example supports the hypothesis that public school teachers in Chicago are motivated to inflate student tests scores

even by cheating as a result of The No Child Left Behind Law, which places accountability for test results on the teachers. A second *Incentive Principle* example demonstrates the motivations of sumo wrestlers in Japan to throw matches under circumstances when critical rankings are at stake to help maintain the status quo. Finally, Levitt and Dubner test people's incentive to cheat a private entrepreneurs' bagel business operating on the honor system for cash collection. All the noted *Freakonomics* examples are quite interesting and relate to the principles being taught in leading contemporary texts.

Mankiw Principle	Frank and Bernanke Principle
Principle 1: People Face Trade-offs	The Scarcity Principle
Principle 2: The Cost of Something Is What You Give Up to Get It	The Principle of Increasing Opportunity Cost
Principle 3: Rational People Think at the Margin	The Cost Benefit Principle
Principle 4: People Respond to Incentives	The Incentive Principle
Principle 5: Trade Can Make Everyone Better Off	The Principle of Comparative Advantage
Principle 6: Markets Are Usually a good Way to Organize Economic Activity	The Efficiency Principle The Equilibrium Principle
Principle 7: Governments can Sometimes Improve Market Conditions	Not a Core Frank and Bernanke Principle
Principle 8: A Country's Standard of Living Depends on Its Ability to Produce Goods and Services	The Principle of Comparative Advantage
Principle 9: Prices Rise When the Government Prints Too Much Money	Not a Core Frank and Bernanke Principle
Principle 10: Society Faces a Short-Run Trade-off between Inflation and Unemployment	Not a Core Frank and Bernanke Principle

By comparison Frank and Bernanke examples demonstrating the incentive principle utilizes the classic invisible hand explanation supported by the observation that supermarket checkout lines tendency to be roughly the same length. They also use two auction examples, the first auction forces the losing bidder pay his highest last bet (very unusual) and a second example uses an abstract political lobbying cost analysis for a mobile carrier license. Mankiw provides one example using an analysis of auto safety laws. The study indicated that wearing seat belts produced little change in the number of driver fatalities because, while wearing them saved more lives, it also gave people an incentive to drive faster and therefore caused more

accidents. His second example assesses basketball star LeBron James' choice to skip college and go straight to pro basketball as an indication of a financially motivated incentive.

While the Frank and Bernanke examples had merit, the *Freakonomics* examples were more interesting to students at West Chester University based on informal feedback from assignments received by this author's students. Other feedback from West Chester University students indicated Mankiw's LeBron James example was easier to understand than the Frank and Bernanke example, however they noted it did not develop enough detail of LeBron James' decision process. It is also the author's opinion that the selected *Freakonomics* examples did a better job balancing interesting topics with salient conceptual points in all cases.

Chapter 2 *Freakonomics* examples demonstrate Frank and Bernanke's core principle of equilibrium and efficiency and Mankiw's Principle 6. An important condition for an efficient market is that both the buyers and sellers have perfect information. Levitt and Dubner use the information asymmetry that exists between real-estate agents and their clients to demonstrate inefficiency in the real estate industry's client-agent relationship because typically the buyers do not have as good information as the agents related to the market. Frank and Bernanke's text makes effective use of used car purchases to demonstrate the efficiency of information in markets. On the surface it appears the emotional linkage to their example would be similar to the *Freakonomics* example. Longitudinal retention research may or may not demonstrate the relative strength or weakness the example of self-serving real-estate agents case over the used car approach, however the *Freakonomics* case does appear to have merit as a case worthy of classroom use, particularly if the class text does not have an example of the principle of efficiency of information.

Chapter 3 *Freakonomics* cases reinforce Frank and Bernanke's cost benefit principle and also illustrate fundamental economics principles such as a "winner take all" labor market. Both concepts are showcased with a study of real and detailed financial records from a Chicago "crack" gang. The records hold detailed information on the operations, organizational structure, and finances of the gang's illegal business. Fixed and variable costs illustrating Mankiw's margin Principle 4 are broken down in a story certain to capture the attention of students. Mankiw's own fixed and variable costs example is the case of Thirsty Thelma's Lemonade Stand. Which example do you think will be more likely remembered by the typical student? The crack gang's records also dispel the myth that all drug dealers are rich and essentially describe a "winner take all" labor market. Frank

and Bernanke illustrate the “winner take all ” labor market concept by asking the following question: Why does Renee Fleming earn millions more than sopranos of only lesser ability? This author randomly asked West Chester University students which example they thought would make a more lasting impression of the “winner take all ” labor market amongst their fellow classmates. The crack gang example was chosen in all cases. It would also appear this example is likely to better reach students with urban backgrounds.

There are many more overlaps in economic concepts that are illustrated in the extant texts selectively noted in Appendix 1 and the popular economic examples in the books noted in Appendix 2. The selected examples above are provided only to illustrate that there is in fact much in common between the approaches. There are also some key differences, which should be understood if we are to consider a methodologically sound analysis of the impact of incorporating socioeconomic cases into university economics curricula.

Before proposing a typology that differentiates between typical contemporary economics class examples and *Freakonomics* style examples a few key considerations must be addressed. Levitt and Dubner do not have exclusive domain over this genre and other notable authors have already published potential contributions (see appendix 2) so the typology should not carry the name *Freakonomics*. The name *Peakonomics* is therefore suggested because it captures the essence of the genesis of the typology as well as the goal of obtaining peak economic literacy. Furthermore the typology should be more dynamic than just a description of what constitutes a *Freakonomics* case by making it a time bound typology. Many university economics professors teach longer than the average age of a typical undergraduate micro or macroeconomics student. Therefore it is easy to imagine how quickly examples that seem relevant to many professors can be alien to the students. In response to this issue the proposed typology contains a 10-year limit due to the natural loss of relevance after 10 years to the typical undergraduate in their late teenage or early adult years. Mastery means the ability to apply content to new situations. Setting out “what the student should be able to do” is essential and lays the groundwork for assessment Hansen (2001). Hansen’s comments lend additional support the validity of the proposed time element of the typology. An optimum duration can be tested quantitatively over time.

Table 2 summarizes a classification scheme that differentiates between the typical contemporary economics text examples and *Peakonomics* typology case examples.

We posit that using the *Peakonomic* typology supports Hansen et al (2002) recommendation that instructors develop graph-free strategies for teaching most concepts based on Cohn et al (2001) experimental evidence demonstrating the limitations of graph-centered instructional technique for economics principles. This typology should be used with moderation and is not intended to degrade the quality of economics pedagogy nor reduce graphs from the curriculum, rather augment them. Additionally we acknowledge that a high percentage of candidate cases for the *Peakonomic* typology will demonstrate the unintended consequence of an action or situation. We are not recommending an instructional bias towards cases demonstrating unintended economic consequences. Instead it is suggested that *Peakonomic* typology cases are paired with intended consequence cases to reinforce the point. With prudent application it is suggested that more graph-free strategies and case examples with *Peakonomic* intrigue will improve concept retention. Certainly more ground is to be gained in the competition for student retention in the field of economics and introducing updated economics examples to courses at the introductory level may assist in making these gains.

TABLE 2 - PEAKONOMIC CASE TYPOLOGY

Parameters of the Case/Example	Peakonomic Typology
Hypothetical Example	Never
Supports a Normative Example*	Never
Real Life Example	Always
Descriptive (Positive) Example	Always
Violates a Normative Standard**	Always
Recent Example (within 10 years)	Always
<p>*The definition of “supports a normative example ” as used above means the subject/action of analysis shows how something should be or occur (ought to be) in the world. **The definition of “violates a normative standard ” as used above means the subject/action of analysis is in ethical or moral opposition to any readily discernable group of people that is apparent to the student. The group could be as broad as law-abiding citizens or as narrow as a specific demographic group. This is included in the typology because it expresses a socioeconomic characteristic making it memorable.</p>	

There are minimally three types of students receiving introductory economics classes at the undergraduate level. These three types include: business

majors interested in economics, undecided students that may be interested in economics, and students from other majors that take economics because it is required for their major or chosen as an elective. Enrollment data demonstrates how important the principles course is to the overall student exposure to the subject. In 1998, of all undergraduate students at four-year institutions, 40 percent completed at least one economics course; 19 percent completed only one course Siegfried (2000). Students who take one economics course, take principles. Students who take two courses, almost always take a two-term principles sequence. Hansen (2002).

CONCLUSION

This paper suggests that including *Peakonomic* typology cases in the introductory two-term classes has the potential to create better retention and appreciation for economics concepts in today's undergraduate students. This paper takes the first step in establishing face validity towards a case typology that can be further investigated via time series tests of retention before and after inclusion of the typology utilizing all or part of a standardized test such as the Test of Understanding in College Economics (TUCE-4) in a broad range of undergraduate academic settings.

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APPENDIX 1

Top 10 Bestselling Amazon Microeconomics Texts January 6, 2007

Method – Using any web browser and click <http://www.amazon.com> then search by textbook, business and investing, economics, and microeconomics sorted by bestselling.

Books that did not have a study guide in some version (indicating they probably were not really textbooks) were omitted from this list.

Top 10 Most relevant Amazon Principles of Economics Texts January 6, 2007

Author(s)	Text Title	ISBN	Rank	Publisher	Full Text
Mankiw	Principles of Economics (Hardcover)	ISBN-10: 0324168624	1	South-Western College Pub: 3 edition	N
Mankiw	Principles of Economics Student Edition	ISBN-10: 0324224729	2	South-Western College Pub: 4 edition	Y
Case and Fair	Principles of Economics (8th Edition)	ISBN-10: 0132289148	3	Prentice Hall: 8 edition	Y
Frank and Bernanke	Principles of Economics + DiscoverEcon code card	ISBN-10: 0073230596	4	McGraw-Hill/Irwin: 3 edition	Y
McConnell and Brue	Economics: Principles, Problems, and Policies, 16th Edition	ISBN-10: 0072819359	5	Irwin/McGraw-Hill: 16th edition	Y
Holt	Principles of Economics (Spiral-bound)	ISBN-10: 0073542857	6	McGraw-Hill Primis Custom: 3 edition	N
Frank and Bernanke	Principles of Economics	ISBN-10: 0072503300	7	McGraw-Hill/Irwin: 2 edition	Y
O'Sullivan and Sheffrin	Economics: Principles and Tools (4th Edition)	ISBN-10: 0131479717	8	Prentice Hall: 4 edition	Y
McConnell and Brue	Economics: Principles, Problems, and Policies (Paperback)	ISBN-10: 007111212X	12	McGraw-Hill/Irwin: 16 edition	N
Case and Fair	Principles of Economics (7th Edition)	ISBN-10: 0131441728	15	Prentice Hall: 7 edition	Y
Hall and Lieberman	Economics: Principles and Applications, 2006 Update (with InfoTrac) (Hardcover)	ISBN-10: 0324335814	21	South-Western College Pub: 3 edition	Y

Method – Using any web browser click <http://www.amazon.com> then search by books, and principles of economics sorted by relevance.

Column rank is the actual ranking on Amazon. When an item is omitted from the list it is because the text was identified as intermediate, financial or otherwise not an introductory academic text. This explains omissions such as ranks 9,10 and 11 in the most relevant list above. Books that did not have a study guide indicating they probably were not textbooks were omitted from this list.

APPENDIX 2

Selected Popular Books with Socioeconomic Examples

Book	Authors	Publisher	Published Date
The Economic Naturalist: In Search of Explanations for Everyday Enigmas	Robert H. Frank	Perseus Books Group	2007
The Winner- Take- All Society: Why the Few at the Top Get So Much More Than the Rest of Us	Robert H. Frank Philip J. Cook	Penguin Books	1996
Hidden Order: The Economics of Everyday Life	David D. Friedman	Harper Collins	1996
Law's Order: What Economics Has to Do with Law and Why It Matters	David D. Friedman	Princeton University Press	2001
Armchair Economist: Economics And Everyday Experience	Steven Landsburg	Free Press; Reprint Edition	1995
More Sex Is Safer Sex: The Unconventional Wisdom of Economics	Steven Landsburg	Simon & Schuster Adult Publishing Group	2007
Freakonomics: A Rogue Economist Explores the Hidden Side of Everything	Steven D. Levitt, Stephen J. Dubner	Harper Collins	2005
The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations	James Surowiecki	Doubleday	2004

USING MOVIES AS A VEHICLE FOR CRITICAL THINKING IN ECONOMICS AND BUSINESS

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ABSTRACT

This paper puts forth an application of movies into the economics curriculum. Seminar courses focusing on critical thinking skills serve as an ideal environment to integrate movie themes into the curriculum. Employing movies as an alternate to chalk and talk can stimulate student interest in economic issues and provide imagery that facilitates retention and long-term memory. The explicit example described in this study is derived from a critical thinking in economics course with a general theme of corporate governance, ethics, and society. Preliminary experiences of the authors have been very positive with respect to both student satisfaction and learning outcomes.

INTRODUCTION

Teaching economics via edutainment efforts is surfacing as a modern approach to supplement, or substitute, for traditional chalk and talk (Becker, 2003). The cost of using conventional chalk and talk to teach, rather than more contemporary outcome-based methods, may be significant in the long run as students choose to move away from economics and into more lively and interesting classes (Becker & Watts, 2001). Some economists have adopted teaching techniques that deviate from the pure lecture method by incorporating movies, television, and other forms of popular culture (Watts, 1998; Kish-Goodling, 1998; Formaini, 2001; Leet & Houser, 2003; Mateer, 2005; Sexton, 2006). Although it is possible that popular culture vehicles are more likely to fully engage students in the learning process, designing a framework that incorporates entertainment without compromising educational rigor can be a challenge.

The purpose of this manuscript is to provide a framework where movies can be applied to the learning environment in economics courses that focus on critical thinking. This paper is divided into four sections. First, a discussion of critical thinking, learning outcomes, and the role of assessment is presented. This is followed by extensive examples of potential discussion questions that can be used for movies with a general theme of corporate governance, ethics, and society. The third section presents a discussion of the critical thinking rubric used in the course. The fourth section offers concluding remarks.

CRITICAL THINKING AND LEARNING OUTCOMES

The focus of education has changed from an emphasis on the amount of material presented (i.e. how many chapters can a class finish in a semester?) to the comprehension of select learning outcomes (i.e. how do I show what my students learned?). The change in focus is due in part to the prominence of assessment in the educational process. Assessment has become the norm at most institutions. The assessment process typically focuses on identifying skills that students are expected to learn, usually referred to as learning outcomes, and then verifying that students have sufficiently gained these skills. The learning outcomes are not merely a recitation of facts but instead concepts and techniques that students must be able to understand and demonstrate.

Many disciplines such as accounting, finance, and management information systems have projects or simulations that can be used to exhibit student comprehension. Other disciplines such as marketing, international business and political science have case studies through which students can display their skills. However, economics, due to its breadth of topics, does not lend itself to just one capstone event. Furthermore, many economics programs include a variety of courses that lack a defined core objective which makes a single project insufficient to demonstrate student knowledge. In comparison, accounting programs typically prepare students for the C.P.A. exam while technology students learn specific programming skills.

One key attribute of all economics classes is the emphasis on critical thinking skills. Problems and situations are presented and through a clear and defensible thought process, potential outcomes are discussed. The development of critical thinking skills is one of the main roles that economics plays in either a liberal arts or a business curriculum. The importance of critical thinking skills is

where economics differentiates itself from the other disciplines. While all disciplines use critical thinking, the process of analyzing many real world situations is based on fundamental economic theories.

The focus on assessment has also come at a time where universities are competing more for students and working harder to retain those students. Kuh (2004), writing about the conceptual framework for the National Survey of Student Engagement (NSSE), finds that what students do in college is more important to their success at learning than who they are or where they go to school. Conclusions drawn from the NSSE survey include that students are more satisfied if they are engaged in the learning environment and are able to clearly see gains in intellectual skills. Two main skills identified are critical thinking or problem-solving skills and social and ethical development.

The focus on social and ethical development is also a fundamental part of the accreditation process by the Association to Advance Collegiate Schools of Business (AACSB). While the organization does not delineate how a school is to teach ethics, all accredited colleges must be able to demonstrate how ethical issues are presented in their curriculums.

The challenge facing economics programs is multifaceted. Not only must fundamental economic principles be taught but it must be put forth in a way that engages students and gives them the problem-solving skills to be successful in other disciplines. In addition, the process must include a method for assessing the success of students at mastering the learning outcomes. This must be accomplished without losing the broad-based exposure to ideas on which economics curriculums thrive.

Active learning has been shown to increase student involvement and retention of information (Kolb, 1981; Erickson, 1984). The interaction from case studies or team projects provides a stimulating atmosphere within the classroom (Carlson and Schodt, 1995; Bartlett, 1996; Palmieri, 1996). Experimental courses provide a natural method for assessing programs (Walstad, 2001). A key point of active learning is to engage the students so that they are unaware they are learning at the same time they are applying the ideas. Many of the economics concepts especially those that involve ethical behavior are tricky to present without becoming preachy. Plus, many students do not have the experiences that enable them to relate to various ethical situations.

Movies provide the needed link between theory and reality. Movies present the topic visually and with the necessary background to allow all the viewers to see and understand the issues. The movies are basically visual case studies with imagery and coding that can augment retention and comprehension (Myers, 2004).

The students don't have to experience the situation in their own lives to identify with the issues. Instead, they are able to see the complexity of the situation from a detached viewpoint. Consequently, students do not immediately take one side or another because of personal experience. This allows the situation to be examined and analyzed without interference from preconceived opinions or biases. Any biases or opinions that do exist are brought out during an open seminar discussion and can be examined.

For success in using movies as a vehicle to teach and demonstrate critical thinking skills, the instructor must have a delineated outline of topics to be covered in order to guide the discussion and keep it on topic. In addition, each movie must present a different aspect in order to avoid repetition of topics. Appendix A provides a list of thirty-five movies on the topic of corporate governance, ethics and society. Exhibit 1 outlines ten movies from the list, each focusing on a different aspect of the overall theme.

The overall topic of ethics is viewed through three lenses: society, intra-corporation and external corporation behavior. Students are challenged with the complexities of decision-making. In *Gattaca*, complete genetic information seems only useful at first until it is used not to help society reach its potential but to control society and remove the right for self-determination. *An Inconvenient Truth* and *City of God* examine the role of how individually it can be hard to change overall society but everyone working together can make that change or decide if a change is even warranted. *Casablanca* asks the quintessential societal question of what is the value of a life. The four movies dramatize basic ethical questions. With just lecture, biases and opinions surface and it can be hard for students to see things from the other side. The movies present the extra dimension that lectures can not provide.

Ethical behavior among colleagues is the sub-theme of three of the movies selected. *Treasure of the Sierra Madre* examines the mistrust that can occur between co-workers especially if individual goals are not in agreement with group goals. It also presents how misunderstandings can lead to a breakdown in group dynamics. *Office Space* and *In Good Company* present aspects of the employer-employee relationship. In *Office Space*, the employee viewpoint is presented while *In Good Company* views the workplace from the employer perspective with the added dimension of age discrimination.

The third focus completes the circle of discussion. The first group examined society's responsibility to its members, the second group examined the responsibility between members of society and the third group presents the responsibility of corporations to society. *Glengarry Glen Ross* presents the classic

salesman dilemma between getting the sale and being honest with customers and losing the sale. *Who Killed the Electric Car?* examines the various firms and organizations involved with the decision to stop production of the electric car. Students are asked to evaluate and assign the degree of responsibility to the groups involved recognizing that no one entity is entirely responsible but the actions of one group affect the actions of the other groups. The cycle of unethical behavior begetting more unethical behavior is presented in *Enron: The Smartest Guys in the Room*. Students see how greed can lead to short-run gains for a few players but long-run destruction of value for all shareholders of a firm not just the stockholders or the unethical players.

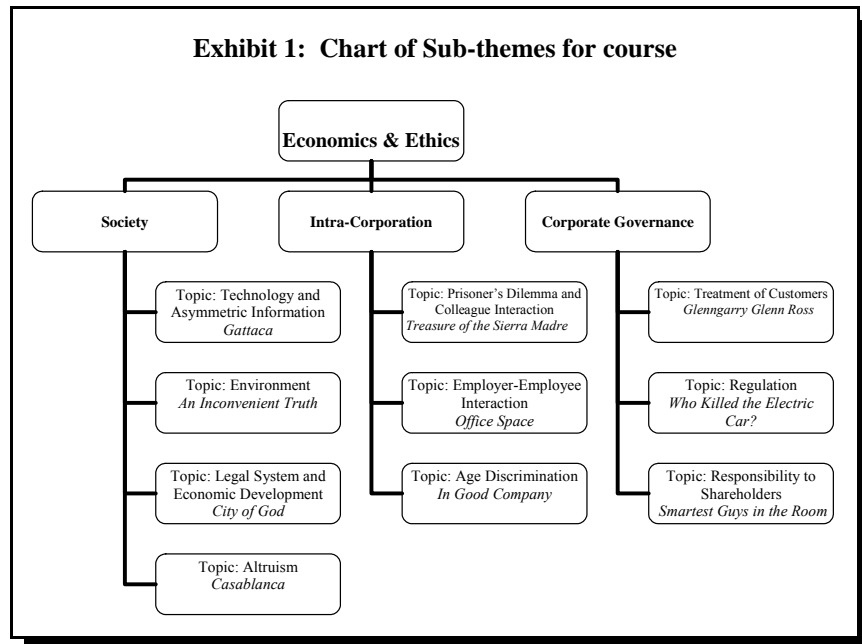
SAMPLE DISCUSSION QUESTIONS

This section provides sample discussion questions for ten movies that could be employed as part of a seminar course focusing on corporate governance, ethics, and society. The questions could easily be modified for different movies with an ethics theme or completely different themes such as labor relations, macroeconomics, civil rights and discrimination, business icons, or cross-cultural relations. Movies are merely the vehicle for engaging the students and providing the needed setting to understand the issues surrounding a topic.

The specific movies with a corporate governance, ethics, and society theme that are included in this section are *Gattaca*, *Treasure of the Sierra Madre*, *Glengarry Glen Ross*, *An Inconvenient Truth*, *Office Space*, *In Good Company*, *Who Killed the Electric Car?*, *City of God*, *Enron: The Smartest Guys in the Room*, and *Casablanca*. Any of the movies in Appendix A could have been used. The specific movies selected by the authors was based on diversity as the sample provides representation from new, classic, foreign, documentary, drama, and comedic films. The diversity of the movies across time and genre allows students to see how similar ideas on corporate governance, ethics and society change over time and are approached in different methods such as comedies and documentaries. The core issues are basic to society and reappear with each generation but with a slightly different twist.

In addition to showing and discussing movies, the course requires foundation lectures on the topics of ethics, corporate governance and regulation. The approach of the authors is an approximate one-third mix of foundation lectures, movies, and discussion with writing assignments.

Exhibit 1 presents a framework of the roles the ten movies play in examining economics and ethics. Any discussion of ethics requires objectively examining the core values of an institution. For economics, the institution can be macro or micro-oriented. Society as a whole is a macroeconomic institution. Four movies present various aspects of ethics from a societal point of view. *Gattaca*, *An Inconvenient Truth* and *City of God* each look at a part of society from technology, the environment and the legal system and ask what is the level of responsibility that governments and society have to its members. *Casablanca* concludes the sub-theme by asking if what constitutes ethical behavior should change during times of distress.



On a microeconomic level, the firm and its relationships with stakeholders outside of the firm along with stakeholders within the firm are examined. Six movies examine assorted issues associated with corporations. Group interaction usually creates ethical situations whether it is between colleagues (*Treasure of the Sierra Madre*) or between employers and employees (*Office Space* and *In Good Company*). The final three movies extend ethical dilemmas to those faced by corporations interacting with the public and other corporations. Society can be the overall public and other corporations (*Who Killed the Electric Car?*), customers

(*Glengarry Glen Ross*), or the various stakeholders in a corporation (*Enron: The Smartest Guys in the Room*).

Gattaca is the first movie shown because many students will not have seen the movie and it relates to something tangible to students – getting the opportunity to prove oneself on the job. *Gattaca* is a science fiction movie that presents how technological advances along with asymmetric information can lead to discrimination. Students examine the trade-off between equity and efficiency.

Questions for *Gattaca* (1997)

1. If significant genetic modification was possible do you think employment discrimination would be a resulting externality?
2. Would you pursue genetic perfection for your child if the technology is available in the not too distant future? Why or why not?
3. If you are single at some point in the future, would you run a quick genetic test on someone you are dating in order to close the asymmetric information gap?
4. Do you believe it will be a good thing or a bad thing if we live in a world with genetic information transparency (i.e., you have more information about your health and genetics but so do prospective employers, insurance companies, etc...)?
5. What do you think is more important---nature or nurture? What about nature on steroids versus nurture?

After engaging the students on the idea of how complete genetic information can be used to help and hinder, *Treasure of the Sierra Madre* presents the situation of a lack of information and how this leads to the prisoner's dilemma especially in partnerships.

Questions for *Treasure of the Sierra Madre* (1948)

1. *Treasure of the Sierra Madre* is considered the first and definitive movie on greed. The entire movie is about the prisoner's dilemma – if they all work together, they can be successful or they can turn against each other. What is the appeal of gold? Is there ever enough?
2. What are the inherent problems in a partnership? How does the arrival of Cody change the dynamics? For example, consider the following quotes

from the movie. Howard says, "I know what gold does to men's souls. As long as there's no find, the noble brotherhood will last, but when the piles of gold begin to grow, that's when the trouble starts." "Gold don't carry a curse. It all depends upon whether or not the guy who finds it is the right guy."

3. Is it easier to be ethical if the parties are extremely poor? Would it be different if the parties were extremely rich and always had been rich?
4. How do the plans each man has for the wealth the gold will bring provide insight into their characters and actions?
5. The movie is known for its film noir cinematography and symbolism. What are some of the symbols and metaphors for the ethical dilemmas in the movie?

Glengarry Glen Ross introduces the third category of ethical behavior by examining sales practices and customer treatment in the name of profits.

Questions for *Glengarry Glen Ross* (1992)

1. The film shows parts of two days in the lives of four desperate real estate agents (Al Pacino, Jack Lemmon, Ed Harris and Alan Arkin) who are prepared to engage in any number of unethical and/or illegal acts (from lies and flattery to bribery, threats and intimidation to burglary) in order to sell undesirable real estate to unwilling prospective buyers ("leads") while the put upon office manager (Spacey) awaits for them to make their sale after the hardnosed corporate boss (Baldwin) gives marching orders to do their jobs (source is wikipedia). To what extent do you think the general nature of being a salesperson leads to a propensitiy toward unethical behavior?
2. What is an effective reward/incentive system for a salesperson?
3. The movie yields the famous acronym of ABC (Always Be Closing) in the scene written by David Mamet entitled "Coffee is for closers." This concept is contrasted by Dave (Ed Harris) explaining that in the past the goal of a salesman was to create a relationship with a customer over a lifetime (sell six cars over thirty years to the same customer instead of pursuing the close of one questionable sell that turns off the customer). Do you feel the future of sales will be driven by the mentality to always be closing or focusing on long-term relationships? Explain.

4. David Mamet altered the original ending of the play when writing the movie. In the play, Roma (Al Pacino) flatters Shelley (Jack Lemmon) and suggests that the two work together. Then, when Shelley leaves the room, Roma turns on Shelley and reveals that his flattery was only a con to get a share of Shelley's sales. In the movie, this last-second turn is omitted, and Roma's flattery is assumed to be sincere. How would the tone of the movie change if the play adaptation of the event would have been portrayed? Why do you think Mamet made the alteration?
5. Acknowledging that there is good money to be made in sales, do you believe you could have a career in sales or do you follow the Lloyd Dobler (John Cusack in *Say Anything*) line of "I don't want to sell anything, buy anything, or process anything as a career. I don't want to sell anything bought or processed, or buy anything sold or processed, or process anything sold, bought, or processed, or repair anything sold, bought, or processed. You know, as a career, I don't want to do that."

After moving from the macro to the micro, *An Inconvenient Truth* returns to the societal aspect of ethics with the questions of whom do you believe based on scientific fact or political affiliation. Furthermore, the documentary asks the viewer to identify the role of society in regards to the environment, especially an environment many years in the future from the perspective of inter-generational equity.

Questions for *An Inconvenient Truth* (2006)

1. Al Gore's basic claim is that global warming is real and largely caused by human externalities of carbon dioxide. On a scale of 1 to 10 (10 being highest), how convinced are you of Gore's proposition after watching the documentary?
2. The Associated Press contacted 19 experts in climate research and all agreed that Gore presents the basic science of climate change correctly. On the other hand, a *Wall Street Journal* editorial by climatologist Richard Lindzen criticized the documentary by stating the claims put forth by Gore are not supported by the currently available data. Who do you trust: The AP, *Wall Street Journal*, neither, or both? Why?
3. Let's assume that you conclude that we should start taking actions to prevent global warming as a move toward being safe instead of sorry. What

specific actions would you suggest and what are the economic implications of the proposed actions?

4. In the end, vote for one of the following as the most likely event: (1) Global warming is real and caused in great part by human beings yielding the need for humans to divert away from much of our use of carbon gases; (2) Global warming is real but a natural part of the life-cycle of the planet. We probably will have another warming phase but our ultimate concern will be dense water vapor that eventually puts us into an ice age; (3) There never has been and there never will be concrete evidence of global warming because it is simply a hypothesis put forth by the scientific community in order to receive grant funding and keep their jobs. In fact, climatologist cannot correctly forecast the weather for next month let alone forecast the pending end of the world. Select one of the three and explain the reason for your selection.

After several heavy movies, the middle of the class has two comedies, *Office Space* and *In Good Company*. *Office Space* looks at bureaucracy in the workplace and how managers treat and motivate employees. *In Good Company* examines age discrimination in the workplace and, of particular interest to students, what a young manager must consider when supervising employees who are older and more experienced. *In Good Company* includes an additional tangent discussion on the ethical treatment of new employees after a merger.

Questions for *Office Space* (1999)

1. Shortly after being asked about the use of a new cover sheet on the TPS report by four different people, Peter (Ron Livingston) explains to the external consultants (the Bob's) that it is hard working for the firm because he has eight different bosses and his only real motivation is to not be hassled. How big of a problem is motivation in the current corporate culture of the United States?
2. Consider the following phrases from the movie *Office Space*: (1) What if we are still doing this when we are fifty; or (2) It would be nice to know we have the job security to still be here at fifty. Which attitude do you think is healthier?

3. One concept put forth by the Bob's is that it is better to fire people on a Friday in order to give them the weekend to cool down. To what extent do you agree?
4. In his hypnotic state Peter is somewhat indifferent about his meeting with the Bob's while everyone else is threatened by their interview out of a fear job loss. The Bob's view Peter's indifference as confidence and become somewhat enamored with his body language and the vibe that surrounds him. The Bob's go as far as to recommend him for an upper management position despite the fact the Peter is rarely showing up for work at the time of the recommendation. To what extent do you think image is more important than content in the workplace with respect to promotion and career advancement?
5. If you worked for a firm that arbitrarily fired you and at the same time promoted a less productive coworker, would you consider minor corporate theft as a reprisal (e.g., the situation put forth to Michael and Samir)? What percent of people do you think would participate in corporate theft under this premise? Explain.

Questions for *In Good Company* (2004)

1. Who do you think is more uncomfortable with the age difference, Dan (Dennis Quaid) or Carter (Topher Grace)? Explain.
2. Do you think it is important to try to blend corporate cultures after a corporate takeover/merger or is it natural for the acquiring company to dominate the target company? Explain.
3. Early in the movie Carter's wife Kimberly (Selma Blair) leaves him and files for divorce. Can a person make a big career push in their youth without it taking a toll on their personal life? Explain why or why not.
4. Mark (Clark Gregg) tells Dan and Carter toward the end of the movie upon hearing that he has been fired "The whole thing seems so arbitrary---I feel used." Dan responds by saying "Yes, it is kind of tough to know you are replaceable." The reality is that almost all of us are easily replaceable at our jobs (Tiger Woods might be a rare exception). This theory of humans being interchangeable in the labor market is one of the tenets of capitalism that concerned Karl Marx. Do you think most people realize they are easily replaceable in the labor market or do you think that most people feel a certain level of ownership of their job? Explain.

5. After being rehired toward the end of the movie *Morty* (David Paymer) states "Timing is everything in life." To what extent do you think this statement is true with respect to the job market and career development?

Who Killed the Electric Car? returns to corporate governance with an examination of regulation and the trade-offs corporations face between societal concerns, regulation and profitability.

Questions for *Who Killed the Electric Car?* (2006)

1. What is the greatest strength versus weakness of the movie?
2. Put in rank order the seven suspects of who killed the electric car by limiting the development and adoption of the EV technology: automobile manufacturers, the oil industry, the U.S. government, battery limitations, the California Air Resource Board, hydrogen vehicles, and consumers.
3. Karl Brauer, editor-in-chief of Edmunds.com, a popular auto market web site, wrote his own criticism of the movie, contrasting the interpretations in the movie with his own in a rumor/fact format. Mr. Brauer's conjecture that "the average L.A. resident's daily driving need is...higher than that national average" is supported by a federal report that in 2001 the average Los Angeles commute was 16.2 miles (32.4 miles daily round trip), which was the highest of all American cities, though that distance is still much less than the typical electric vehicle range. Given this information versus the documentary, are you more likely to believe Brauer or director Chris Paine? Explain.

A central idea is: does the government have an ethical obligation to provide and protect property rights of all its citizens along with providing a just legal system? *City of God* examines these issues in the setting of the slums of Rio de Janeiro, Brazil. The movie details the difficulties of economic development especially with weak government institutions.

Questions for *City of God* (2002)

1. The tagline for *City of God* is "Fight and you will never survive...Run and you will never escape." In your opinion, is there any way out of the cycle of poverty? Explain.

2. Only one professional actor served in the movie the City of God. The director provided a couple of months of direct acting training but did very little rehearsing despite the inexperienced cast because he wanted to maintain a street feel with the work. What letter grade (A, B, C, D, or F) would you assign the director and why?
3. The movie *City of God* is based on real people and real events. How is it possible that youth gangs could take over major portions of a major city of the world like Rio de Janeiro for over twenty years (1960's until the late 1980's)?
4. Is the violence created in a slum area (in this case the slum is Rio Favela) the externality associated with being trapped in a situation with little or no economic opportunity (e.g., happens out of desperation) or is it simply created because a handful of people take advantage of a neighborhood that is not a priority for police and society to protect (i.e., with no explicit legal authority or protection of property rights in the slum areas the gangs move in to fill the power void)? Explain.
5. Assume you could go back to your childhood and were placed in Rio of the seventies. Do you think you are more likely to follow a path of Rocket or the path of Lil Ze? Explain your response.

No economics and ethics course would be complete without an examination of Enron. The *Enron: The Smartest Guys in the Room* documentary presents the corporate culture of Enron and how it contributed to one of the biggest corporate governance scandals in recent U.S. history. Ethics versus economics is presented as employees work under intense pressure for profits and a willingness to lie to maintain the stock price.

Questions for *Enron: The Smartest Guys in the Room* (2005)

1. The tagline for the movie is "It's just business." Is this an adequate justification for business actions? Why or why not?
2. The vitality curve (also known as rank and yank) is a management philosophy in which the employees are ranked and the lowest performers are routinely fired. GE and Enron are two famous firms that have used this process. Discuss this management philosophy. What kind of corporate culture does this practice create? What is the long-run effect of this practice?

3. Milgram's experiment was a study on social psychology that measured the willingness to obey an authority to do something in conflict with one's conscience. Enron employees provided this reasoning for their behavior. Discuss.
4. To whom is the firm responsible – stockholders, bondholders, employees, customers, the firm itself? What role does Wall Street play in Enron's story?
5. Would you quit a job when you have reason to believe some people in the firm are unethical but you are making a high salary with great stock options? There is no smoking gun, just a question on how we are making these enormous profits. How does your response relate to the plight (made a lot of money and then lost a lot of money) of average Enron employee?
6. Based on anecdotal evidence, former Enron employees now at other firms tend to hire each other. Is this a lack of ethics or the result of understanding from a shared experience?

The final movie ends the class back where it began with a movie that examines ethics in a societal sense. While many people have seen *Casablanca*, few viewers will have viewed it under the umbrella idea of ethics. The movie, through many examples and characters, asks the simple question of what is the value of another person's life. As Humphrey Bogart contemplates his goals versus the greater good, the movie presents the many small ethical decisions that people face daily especially during times of war and distress. The class started with a discussion of core values from an individual point of view and ends with the defining core value of a person and of a society.

Questions for *Casablanca* (1942)

1. Consider the following statement by Ugarte (Peter Lorre): "You know, Rick, I have many a friend in Casablanca, but somehow, just because you despise me, you are the only one I trust." What does the statement imply with respect to the type of city Casablanca is?
2. Consider the following statement by Senor Ferrari: "As the leader of all illegal activities in Casablanca, I am an influential and respected man." To what extent are leaders of illegal activities influential and respected people, both in the past and the present?

3. It could be argued that captain Renault (Claude Rains), the Chief of Police, is the most immoral character in the movie. He sells letters of transit at a scalpers price, provides deals to young women for letters of transit for in kind favors (including the Bulgarian newlywed), does not pay for his liquor, is shocked to find gambling taking place at Rick's despite being awarded his daily winnings before shutting down the casino, solves a crime by rounding up the usual suspects (or possibly rounding double the number of usual suspects given an extreme crime), and is cozy with the Nazi regime as needed. Which is Renault better suited for in the modern world: (1) Corporate executive; (2) Politician; (3) Lawyer; (4) Anchorman; or (5) Police Chief? Explain.
4. Given that *Casablanca* is the original great chick's movie, does Ilsa (Ingrid Bergman) truly love Rick or is she playing with him throughout in order to gain the letter of transit for Victor (Paul Henreid)? Does it make a difference given the movie was made in 1942 versus the reality television world of today? Some critics have expressed the view that Ilsa as one of the more unlikable characters in a movie full of potentially unlikable characters? Do you feel she is an unlikable character? Explain.
5. Consider two of Rick's (Humphrey Bogart) famous comments: "I stick my neck out for nobody" and "I'm the only cause I'm interested in." Why would Adam Smith find a kindred spirit in Rick? Despite the previous statements the culmination of the movie finds Rick telling Ilsa "I'm no good at being noble, but it doesn't take much to see that the problems of three little people don't amount to a hill of beans in this crazy world." Is Rick self-centered, a noble citizen of the world, or simply someone struggling to find his moral compass? Explain.

COURSE ORGANIZATION AND ASSESSMENT

One of the bigger challenges of teaching a non-traditional course is how to evaluate students. A movies thematic course relies heavily on seminar discussion, written communication in the form of writing assignments and essay examinations.

In order to watch the movies in their entirety at one sitting, the class was organized as two consecutive class periods. Students were given the discussion questions in advance and a student leader was chosen for each movie. The discussion following each movie was initiated by the faculty member and the

student leader. This provided the needed flow to begin drawing out the main issues. The other students were sequentially included in the discussion.

Not all students were initially comfortable with a discussion-based class but by providing open-ended questions and allowing students to develop their arguments through the discussion eventually all the students are easily engaged and comfortable. As with all discussion-based learning, it is important to allow all ideas to be presented and not allow any one individual to dominate the discourse.

After each movie, students were required to write an essay on the movie and corresponding lecture material. Students were encouraged to wait a few days before writing in order to allow the ideas to percolate and develop the richness needed for analysis. The essays also included a section on current examples of the dilemmas in the news. By including the current events, students were able to see how pervasive the ethical dilemmas are and how there isn't actually a definitive solution to many of the dilemmas. They begin to understand how certain characteristics in a corporation or in society create the environment for ethical dilemmas. Finally, students learn the art of taking a stand on an issue and presenting a clear verbal or written argument.

Exhibit 2 provides the grading rubric used for this class, which was adapted from the critical thinking teaching model of Washington State University (2008). For each learning objective, students are assessed as accomplished, competent, sufficient or insufficient, with related grades ranging from an A for accomplished to a D/F for insufficient.

Exhibit 2: Grading rubric for course				
Learning Objectives	Level 1 Insufficient	Level 2 Sufficient	Level 3 Competent	Level 4 Accomplished
Identifies the issue or question	Demonstrates severe misconceptions about the important themes or issues.	Displays an incomplete understanding of the important issues in a question or problem.	Displays a rather complete understanding of the important issues or themes in a question or problem.	Displays a thorough and accurate understanding of the important issues or themes in a question or problem.
Identifies and considers the influence of context and assumptions	Does not relate to other contexts.	Analysis includes some outside verification but primarily relies on established authorities.	Analysis acknowledges complexity although may hold to bias in context.	Analyzes the issue with a clear sense of scope and context, including assessment of audience.

Exhibit 2: Grading rubric for course				
Learning Objectives	Level 1 Insufficient	Level 2 Sufficient	Level 3 Competent	Level 4 Accomplished
Develops, presents and communicates personal viewpoint	Fails to present or justify own opinion or forward hypothesis.	Position or hypothesis is clearly inherited or adopted with little original consideration.	Position includes some original thinking that acknowledges, refutes, synthesizes or extends other assertions, although some aspects may have been adopted.	Position demonstrates ownership for constructing knowledge, integrating objective analysis and intuition while integrating contrary views.
Presents, assesses, and analyzes supporting evidence	Excludes data and information.	Overlooks some information and does not distinguish among fact, opinion and value judgments.	Demonstrates skill in searching, selecting and evaluating information but confuses causality and correlation.	Synthesizes and assimilates data, questions data's accuracy, relevance and completeness and recognizes bias.
Integrates other disciplinary perspectives and viewpoints	Deals with a single perspective and fails to discuss other' perspectives.	Begins to relate alternative view to qualify analysis.	Engages challenging ideas tentatively or may dismiss alternative views hastily.	Integrates own and others' ideas in a complex process of judgment and justification in a respectful manner.
Identifies and assesses conclusions and implications	Fails to present any solution or recommendations.	Acknowledges some aspects of context to the problem and solution but presents conclusions as relative and not considering consequences.	Considers the influence of context on the choice of solutions. Presents implications that may impact other people or issues.	Demonstrates a clear sense of context in proposed solutions. Implications are developed and ambiguities are considered.
Communicates effectively	In many places, language obscures meaning. No citing of sources.	Language does not interfere with communication. Sources are cited.	Errors are not frequent or distracting although there may be some problems with style and voice. Sources are cited and used correctly.	Organization and style are clear and transitions between ideas enhance presentation. Employment of sources understands the issues involved with using information.

The seven learning objectives encompass the full range of discussion and growth in critical thinking. Initially, students are asked to identify the issues but also understand and analyze the context and assumptions surrounding the core issues. As students develop and present their viewpoints, they must include supporting information while addressing contrary views. Part of the development of a viewpoint is to assess the issue from a variety of perspectives and recognize the implications of the conclusions on the various sides. Finally, the quality of the communication is considered. While not a traditional construct of critical thinking, the ability to effectively communicate one's viewpoint affects its perception and impact. Instead of just summarizing, the overall goal of critical thinking is to provide conclusions that take into account the information available and the context in which the information is gathered, other viewpoints and the implication of the conclusions.

CONCLUSION

Modern students are often not adept at learning via the traditional chalk and talk presentation style of many economics professors. Students are increasingly more visual learners that desire education in a more fun and engaging format. Furthermore, as universities and programs compete for the top students, they must provide the learning experience that students expect. Accrediting bodies are increasingly focusing on assessment of learning outcomes and encouraging educators to assure retention of core concepts. In addition, ethics is being required to be incorporated across curriculums, further adding complexity to the way economics is taught.

Economics has a defined role in this new environment. As a main source of definitive classes that develop critical thinking skills, economics can bridge the gap between presenting theory and stimulating problem-solving skills. No where are the ambiguities of problem-solving more apparent than in ethical dilemmas. Movies present an intriguing vehicle for engaging students and presenting the ethical dilemmas with the necessary depth that the students need without being preachy. By recognizing the variety of ethical dilemmas that exist in both the macroeconomic and microeconomic environment, students are able to analyze the situations by applying economic theory and not just opinion. Furthermore, the class discussions and written assignments on the movies provide the needed documentation for assessment purposes.

The initial experiences of the authors with this class have been surprisingly positive. Student satisfaction with the course was extremely high and the faculty members included felt that the students rose to the challenge and looked beyond the simple opinions and viewpoints to an in-depth analysis of the issues. The students prided themselves on playing devil's advocate to bring out the inherent trade-offs society, corporations and individuals face with ethical dilemmas. Equity versus efficiency, how do you decide who to fire, what is the responsibility of a government to its population and the value of a human life were just some of the spirited debates in the class. The students clearly demonstrated not just mastery of economic theory but of the economic thought process and especially, its role in evaluating ethical situations.

The potential for direct assessment of movies as a method is possible via national exams like California Critical Thinking Skills Test and the Education Testing Service (ETS) Major Field Achievement Test in Business. Eight students completing the course also completed the ETS exam at the end of the semester and scored ten percentile points higher on average than other business students, although the sample size of the control group is not large enough to explore an empirical evaluation. Future research should augment this initial theoretical foundation with an empirical investigation.

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APPENDIX A**Sample List of Movies for the Theme of Corporate Governance, Ethics, and Society**

The Apartment (1960)	Boiler Room (2000)
Casablanca (1942)	A Civil Action (1998)
The Corporation (2003)	Crash (2004)
Dirty Rotten Scoundrels (1988)	Dogville (2003)
Do the Right Thing (1989)	Double Indemnity (1944)
The Emperor's Club (2002)	Erin Brockovich (2000)
Enron: The Smartest Guys in the Room (2005)	Fun with Dick and Jane (2005)
Gattaca (1997)	Glennegarry Glenn Ross (1992)
Grapes of Wrath (1940)	In Good Company (2004)
An Inconvenient Truth (2006)	The Insider (1999)
Lord of the War (2005)	Matchstick Men (2003)
Mississippi Burning (1988)	Mr. Deeds (2002)
Office Space (1999)	The Rainmaker (1997)
Schindler's List (1993)	Syriana (2005)
Tin Men (1987)	Trading Places (1983)
Traffic (2000)	Treasure of the Sierra Madre (1948)
Tucker: The Man and His Dream (1988)	Wal-Mart: The High Cost of Low Prices (2005)
Wall Street (1987)	Who Killed the Electric Car? (2006)

ECONOMICS ARTICLES

DYNAMICS OF NATIONAL DEBT ACCUMULATION AND ECONOMIC PERFORMANCE

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ABSTRACT

Many countries have run persistent budgets deficits in recent years. This has led to a dramatic growth in national debts and a concern that this trend could lead to "debt overhang" and bankruptcy. The present paper investigates the dynamics of debt accumulation effect on income growth with focus on three different groups of countries in Sub-Saharan Africa. For low income countries that are benefiting from debt relief, it appears important to understand more how the reduction of external debt and debt service affect growth. Our results suggest that low levels of external debt are associated with higher economic growth rates.

KEY WORDS: National debt, debt overhang, dynamics of debt accumulation, economic growth.

INTRODUCTION

There has been in recent years among citizens of various countries increased apprehension from the issue of national debt accumulation and its consequences on economic growth. The necessary outcome of persistent deficit financing might be a nation's debt so large that its interest payments exceed national income. If a country's debt level is predicted to surpass the country's reimbursement ability, then anticipated debt service can only be a rising function of the country's output level. This becomes a catch 22 in the sense that proceeds from domestic investment are rather diverted toward foreign creditors instead of accruing national income through reinvestment. Further more, for low income countries, high external debts can reduce the government's incentive to carry out structural and fiscal reforms, since the strengthening of the fiscal position could intensify pressures to repay foreign creditors (Clements et al, 2003). This is highly sensitive for low income countries where there is urgency in meeting structural reforms in order to achieve higher economic growth.

Most African countries have received large amount of loans over the years at highly prohibitive interest rates. This stock accumulation of debt so large has increased countries inability to pay back with the consequence of driving away potential lenders and investors.

Krugman (1988) defines this situation as "debt overhang". This happens when expected repayments on external debt falls short of the contractual value of the debt to the point of harshly hampering the economic performance of the debtor country. The debt overhang concept implies that when external debt grows large, investors lower expectations of return in anticipation of higher and progressively more distortionary taxes needed to repay the debt. Also, new domestic and foreign investment is discouraged to the point of slowing capital-stock accumulation and factor productivity growth (Patillo et al, 2004). After many low income countries rapidly accumulated debt in late 1980s and 1990s, it was recognized that providing aid largely in form of loans had led to excessive debt burden, particularly in sub-Saharan Africa. This realization was one of the factors leading to the introduction of the Heavily Indebted Poor Countries (HIPC) initiative in 1996, the enhanced HIPC initiative in 1999, and the Multilateral Debt Relief Initiative (MDRI) in 2006. The intention was to ease the debt burden. Countries could redirect resources to critical social expenditures, public investment and recreate a new fiscal and debt space that can be used to pave the foundation for satisfactory durable growth while keeping debt sustainable. The fundamental question to know whether or not debt relief can boost growth in poor countries. At what extent does external debt have a negative impact on economic growth to expect debt relief such as the initiatives described above to be effective? These are questions that can be answered by analyzing the dynamics of debt accumulation and income growth in defining the debt/growth relationship useful in assessing the effectiveness of HIPC Initiative in enhancing growth. Although, there has been extensive inquiry on the effect of external debt on growth, few studies have focused on low income African countries. The emerging markets economies experiment where most of the research has focused must be interpreted with prudence in evaluating debt/growth in low-income countries.

This paper examines the incidence of external debt on growth in three separate countries sub groups in sub-Saharan Africa. Based on their respective GDPs the last few years, countries were clustered as upper middle income, lower middle income, and low income in an attempt to extract potential differences. The rest of the paper is organized as follows. Section two summarizes theory and previous related literature on external debt and growth. Section three describes the data, the estimation methodology, and the model before discussing the results. Section four concludes and reflects on the policy implications of the findings.

THEORY AND RELATED LITERATURE REVIEW

Past literature and especially the most recent recognize that not all foreign loans discourage investment and growth. The objective of the debt sustainability framework designed by the World Bank and the International Monetary Fund (African Consultative Group, meeting April, 2007) is to help low income countries "to mobilize the financing they need to meet their development needs while mitigating the risks of an excessive debt build-up". At low level of debt, additional borrowing could foster growth, to the extent that the

new borrowing enhances the country's productive capacity and add to capital accumulation. At higher economic growth, a country should be able to service its debt better. However as both debt and capital grow, additional return to investment may head in opposite direction because when the debt-service cost rises this will discourage foreign and domestic investment (Krugman, 1988, Sachs, 1989). These are the consequences of debt overhang which in addition to depressing investment increase uncertainty. Private investors who face uncertainty may prefer to wait (Serven, 1997). There is ambiguity as to the action the government might take to meet its debt-service obligations. Oaks and Wijnbergen (1995) conclude that a rapid accumulation of debt lead to an increasing capital flight, should the private sector fear imminent devaluation and /or increases in taxes to service the debt.

Patillo et al. (2002, 2004) conducted an empirical study on the relationship between total external debt and the growth rate of GDP for developing countries in general using a large dataset of 61 countries over the period 1969-98. They found a negative impact of high debt on growth and two sources of growth. The negative effect was stronger on capital accumulation than on total productivity growth for these two sources of growth as tested in that study. These findings were also true for net present value of debt levels 35-40 percent of GDP and or 160-170 percent of exports. For high-debt countries, doubling debt reduced output growth by 1% and reduced both capital accumulation and total factor productivity growth by less than 1%. A test of presence of nonlinearity between debt and growth was also conducted. They found a backward bending growth curve with a debt/growth positive relationship at low levels of national debt and negative relationship at high levels. This leads to conclude that the effects of debt-overhang are likely to occur only after a threshold level has been reached. Comparing industrialized countries to developing countries, Schclarek (2004) found that for industrialized countries there was no significant relationship between gross government debt and economic growth. He separates total debt into public external debt and private external debt in comparing their respective incidence on growth. While the study did show that the negative relationship between growth and debt for developing countries was strongly driven by the incidence of public external debt, private external debt was not a significant factor. Empirical studies have also shown that external debt can crowd out private investment or alter the composition of public spending (Clements et al. 2003). High debt service can raise interest rate through increased budget deficits. To finance these budget deficits, the government may crowd out credit available to the private investment causing a decrease in economic growth. Other studies of nonlinear effect of debt on growth include Fosu (1999), Elbadawi et al. (1997), Deshpande (1997) and Chowdhury (2001). In their studies, they found indication of debt overhang hypothesis. In contrast, Savvides (1992) finds that the ratio of debt to GNP has no statistically significant effect on growth and Dijkstra and Hermes (2001) conclude that there is no empirical evidence of debt-overhang hypothesis, at best, the last is inconclusive. Surprisingly, Cohen (1997) finds that the probability of debt rescheduling significantly lowers growth.

The objective of this study is to add to the existing literature and help shed more light in an area where there are many gaps to still fill because of mixed results reached. For

low income countries that are benefiting from debt relief, it appears important to understand more how the reduction of external debt and debt service affect growth.

ESTIMATION METHODOLOGY, DATA, MODEL AND DISCUSSION

Dynamics of National Debt

The dynamics of national debt are examined following Livernois et al, 1996 approach.

Let's $D(t)$ represent the value of debt at time t and $Y(t)$ represent the dollar value of national income or GNP at time t . All variables are denominated in real dollars and therefore abstracting from inflation. If we assume that the deficit is a constant proportion of national income at any point in time, then the change in debt is just the deficit. The differential equation that describes the behavior of the debt can be written as follows:

$$\dot{D} = bY \quad b > 0 \quad (1)$$

Should the value of b fall in the range 0.03 to 0.07, this means that deficits are about 3% to 7% of the size of national income. We also assume that national income grows over time according to the following differential equation:

$$\dot{Y} = gY \quad (2)$$

Where g is a positive constant representing the growth rate of national income. Both (1) and (2) are models of debt accumulation. In order to test the implications of the model for the long run ratio of interest payments to national income, we need to solve these equations. We can for instance rewrite equation (2) as

$$\frac{\dot{Y}}{Y} = g$$

Integrating both sides gives

$$\ln Y(t) + c_2 = gt + c_2$$

Which we can rewrite as

$$Y(t) = c_1 e^{gt}$$

Where $c_1 = e^{c_1 - c_2}$. Let assume the initial time is $t_0 = 0$ and the initial values of income and debt are Y_0 and D_0 , respectively, we require $Y(0) = Y_0 = c_1$

The solution to the initial-value problem for equation (2) is

$$Y(t) = Y_0 e^{gt} \quad (3)$$

Substitution of this solution into (1) gives

$$\dot{D} = bY_0 e^{gt}$$

Integrating both sides give

$$D(t) = bY_0 \frac{e^{gt}}{g} + c_2$$

Since $D(0) = D_0$ the value c_2 must be set to $(D_0 - \frac{b}{g}Y_0)$ the solution becomes

$$D(t) = D_0 + \frac{b}{g}Y_0(e^{gt} - 1)$$

The national debt $D(t)$ grows without limit in this model. Our concern is with the country to meet its interest obligations on the debt. If we assume a constant interest r and calculate the ratio of interest payments $[rD(t)]$ to national income $Y(t)$

$$\frac{rD(t)}{Y(t)} = r \frac{D_0 + bY_0(e^{gt} - 1)/g}{Y_0 e^{gt}}$$

Let's $z(t)$ be $rD(t)/Y(t)$ as the share of national income absorbed by interest payments on national debt. Simplifying produces

$$z(t) = r \frac{D_0}{Y_0} e^{-gt} + r \frac{b}{g} (1 - e^{-gt}) \quad (4)$$

Because equation (4) gives the ratio of interest payments to national income at any point in time, our interest is to determine whether this ratio converges to a finite limit less than 1. In other words, interest payments never become as large as national income. From equation (4), $z(t)$, the ratio of interest obligation to income converges to a finite limit as $t \rightarrow \infty$. To see this, let's take the limits of the two terms on the right-hand side as $t \rightarrow \infty$, keeping in mind that e^{-gt} goes to 0 as $t \rightarrow \infty$. We obtain

$$\lim_{t \rightarrow \infty} z(t) = r \frac{b}{g} \quad (5)$$

Interest expenditure on the debt can now converge to a useful steady percentage of national income equal to rb/g . If $rb/g < 1$, then if a government for ever runs a deficit which is a predictable constant proportion of a rising national income, the impact on the economy of the consequential debt converges to a constant share of the national income. Therefore, the economy will always be able to meet its debt obligations and insolvency will never occur. On the contrary, if $rb/g > 1$, then the process converges to a finite limit where the interest expenditure exceed national income. The economy would be destined to experience insolvency if it continued to run deficits. Because $\dot{D} = bY$ and $\dot{Y} = gY$, the ratio of the increase in debt to the increase in income, \dot{D} / \dot{Y} , is just b/g . Therefore, for every dollar increase in national income, debt increases by b/g . Suppose $b/g = 0.5$, then for every dollar increase in national income, debt increases by 50 cents. In this case, income is growing faster than debt so the ratio of debt to income will always be less than unity. On the other hand, suppose that $b/g = 1.6$. Then, every dollar increase in income leads to a \$1.60 increase in debt. Debt is now growing faster than income, so the ratio of debt to income will definitely exceed unity eventually. In this case, interest on the debt could also exceed national income if the interest rate is high enough.

Some typical values for the ratio b/g in tables 1, 2 and 3 are calculated from *Africa Development Indicators 2006* of the World Bank for three representatives of each sub-group as defined in the present study. The Democratic Republic of Congo (DRC) represents the lower income countries, Angola, the lower middle and Botswana the upper middle. The results suggest that most African countries borrowed heavily from abroad in the 1970s and 1980s with the objective of meeting their effort of industrialization challenge. For the DRC, the decade of the 1980s was characterized by very high b/g values with the year 1982 setting the record ($b/g = 176.32$). Then every dollar increase in GDP led to an overwhelming \$178.32 increase in debt for that year. The rest of the 1980s decade in DRC saw more

moderate but still high b/g values ranging from 1.23 to 18.08. Three years (1985, 1986 and 1988) showed negative b/g values.

Year	% Δ D(.00)	% Δ Y (.00)	b/g
1981	0.074	0.06	1.23
1982	0.264	0.0015	176.32
1983	1.047	0.0813	12.87
1984	0.5752	0.0318	18.08
1985	0.1242	-0.049	-2.53
1986	0.1406	-0.053	-2.65
1987	0.0913	0.007	13.04
1988	0.1937	-0.053	-3.65
1989	0.0218	0.004	5.45
1990	0.0904	0.021	4.3
1991	-0.0068	0.023	-0.29
1992	-0.0155	-0.004	3.875
1993	0.0603	0.014	4.31
1994	-0.0203	0.055	-0.36
1995	0.1834	0.0046	39.86
1996	0.2326	0.047	5.025
1997	0.222	0.026	8.538
1998	-0.035	0.004	-8.75
1999	0.138	-0.012	-11.5
2000	0.094	-0.065	-1.44
2001	0.00007	-0.084	-0.0008
2002	-0.047	-0.105	0.44
2003	-0.034	-0.134	0.25
2004	0.041	-0.039	-1.05
2005	0.035	0.007	5
2006	-0.082	-0.01	8.2
2007	-0.07	-0.056	1.25

For the last, the negative signs came from a decline in GDP rather than a decline in outstanding debt. For instance, a $b/g = -2.53$ means for every dollar decline in GDP, the outstanding debt went up \$2.53 in 1985. No data was available for Angola in the 1970's and 1980's because of post-independence civil war conflict. Botswana, a high middle income country, exhibited very moderate b/g values ranging from .80 to 3.98. Toward the end of the decade (1988, 1989), negative b/g values are attributable to decline in the borrowing rate unlike in the DRC earlier where negative b/g came from fading GDP in the 80's. For instance, a $b/g = -5.31$ in 1988 means that for every dollar increase in GDP in Botswana, debt declined by \$5.31.

Year	% Δ D(.00)	% Δ Y (.00)	b/g
1991	1.35	-0.064	-22
1992	0.887	0	0
1993	0.189	0.042	4.5
1994	2.432	0.0599	40.6
1995	0.3763	0.0349	10.74
1996	0.3485	0.0279	12.49
1997	0.2446	0.079	3.09
1998	0.068	0.056	1.21
1999	0.09	0.0039	23.07
2000	0.074	-0.003	-24.66
2001	0.019	-0.0119	-1.59
2002	0.063	-0.069	-1.095
2003	0.029	-0.247	-0.117
2004	0.0342	0.035	0.97
2005	0.031	0.104	0.29
2006	-0.044	0.112	-0.29
2007	-0.041	0.079	-0.52

The 1990s came as the decade of structural adjustments, a macroeconomic house cleaning operation for poor countries around the

globe. This is reflected in the dynamics of national debt in the three representative countries studied. In DR Congo, the b/g values in the 1990's range from a positive high of 39.86 and a low of 3.875. The encouraging sign was that two out of three of the negative b/g s were from a decline in the borrowing rate and only one came by way of a waning GDP. For the rest of the years, moderation in debt accumulation appeared to be the trend when compared to the decade before. It was however unclear whether this was the result of pressures from structural adjustments imposed by donors or simply the effect of a persistent economic decline in the DRC that had excluded the country from the global credit market.

In Angola, while economic growth in the 1990's ranged from 0% to 8%, national debt accumulation was very high. The ratio of debt to income was way above unity. The range for b/g values was between 0 and 40.6. The only negative value was from economic decline in 1991. Angola is wealthy from oil and diamonds exports and considered to have sustainable debt. The majority of the \$10 billion is owed to countries involved in the cold-war era decades of war. In the 1990's, Botswana showed a positive trend in its ratio of debt to income. Clearly toward the end of the decade of the 1990's, very healthy b/g s of .08 and .10 indicated that income or GDP was growing faster than the debt so the ratio of debt to income was less than unity. Finally, the decade of the 2000's was a clear cut for describing in a distinct manner the relationship between debt and income based on the country classifications as set in this study. While the low income country DRC exhibited negative growth throughout the decade with the exception of 2005 (.7%), its ratios of debt to income were at best moderate compared to the 1980's. The country underwent political unrest for democratic reforms early 1990s before slumping into a war from invading foreign armies in 1996. The low levels of debt observed during that period are mostly due to the country's failed state status and inability therefore to engage in any capital inflow including contracting loans. The low middle income country Angola shows negative growth in early 2000s. But by mid and late 2000s, there is a sudden turnaround in economic growth ranging from 7 to 11%; b/g s were negative the last two years of the study with a trend toward lower borrowing rates. Botswana, the high middle income country on the other hand shows a strong

leaning toward negative ratios of debt to income throughout the 2000s- a clear sign of a strong will to control its debt.

CONCLUSION

The present paper explores the dynamics of debt accumulation effect on income growth with focus on three different groups of countries in Sub-Saharan Africa. One country representative in each group was chosen. Our results suggest that low levels of external debt are associated with higher economic growth rates. There is sufficient evidence to support in this study that soaring level of debt through time can depress economic growth. The case of the DRC as compared to Botswana indicates that negative ratio of debt to GDP is the most recent trend for low-income countries that are serious about controlling debt, provided that this negative ratio does not originate from declining growth rate, but rather from declining debt rate through time. On the policy side, the effects of aid and debt relief to low income countries in Africa will indeed affect the ratio of debt to income in a way that foster economic growth only if applied to each country in the context of its own specific macroeconomic determinants of growth. Additional research could further evaluate other indirect channels through which debt can affect growth. For instance, can debt have an indirect effect on growth through crowding-out of public investment? It is more likely that debt service may achieve this even if the stock of public debt itself does not appear to depress public investment.

Year	%Δ D(.00)	%Δ Y (.00)	<i>b/g</i>
1981	1.028	0.258	3.98
1982	0.456	0.263	1.73
1983	0.183	0.228	0.8
1984	0.276	0.088	3.13
1985	0.086	0.088	0.97

Table 3. Dynamics of National Debt Accumulation for Botswana (Upper income country) from 1981-2007.			
Year	%Δ D(.00)	%Δ Y (.00)	<i>b/g</i>
1986	0.171	0.106	1.61
1987	0.213	0.12	1.77
1988	-0.76	0.143	-5.31
1989	-0.09	0.121	-0.74
1990	0.252	0.119	2.11
1991	0.087	0.09	0.96
1992	0.318	0.121	2.63
1993	0.279	0.131	2.129
1994	-0.012	0.085	-0.14
1995	0.195	0.071	2.74
1996	0.151	0.082	1.84
1997	0.143	0.118	0.82
1998	0.017	0.194	0.08
1999	0.014	0.13	0.1
2000	0.088	0.067	1.31
2001	0.065	0.074	0.88
2002	-0.057	0.029	-1.96
2003	-0.027	0.019	-1.52
2004	-0.029	0.036	-0.8
2005	-0.082	0.044	-1.86
2006	-0.078	0.055	-1.42
2007	-0.161	0.068	-2.41

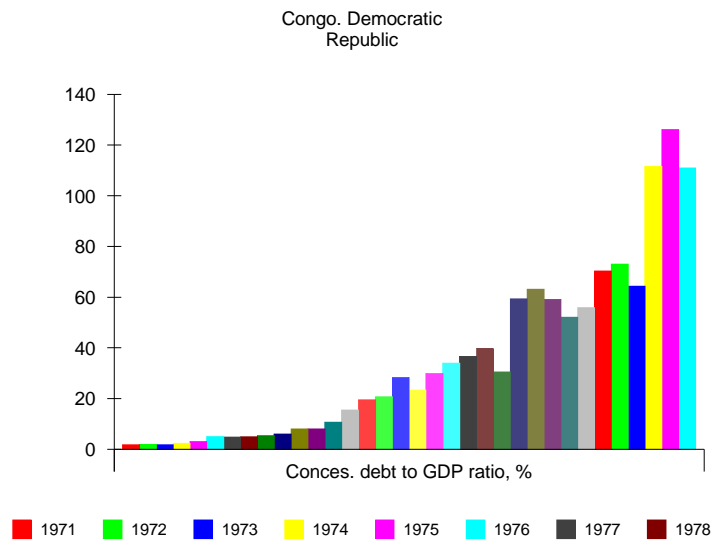
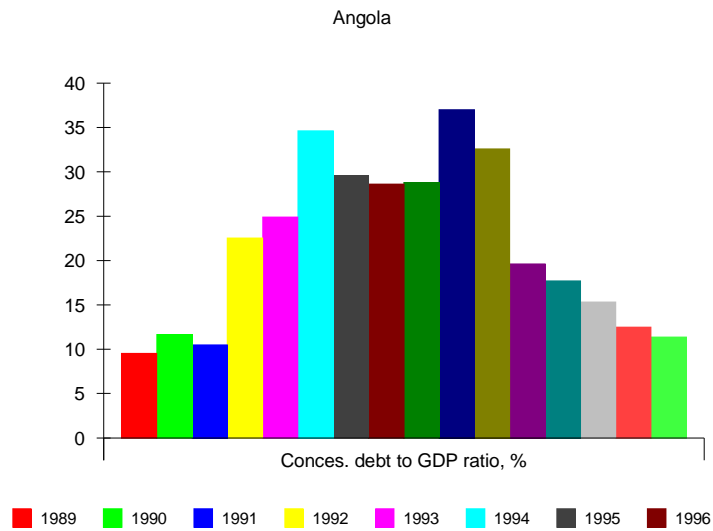
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Appendix 1	
Sub-group lists of Countries	
Upper Middle Income	Lower Middle Income
Botswana	Angola
Equatorial Guinea	Cameroon
Mauritius	Cape Verde
Mayotte	Congo Republic
Seychelles	Lesotho
South Africa	Namibia
	Swaziland
Lower Income	
Benin	Malawi
Burkina Faso	Niger
Burundi	Nigeria
Cote d'Ivoire	Rwanda
Democratic Republic of Congo, DRC	Sao Tome and Principe
Eritrea	Senegal
Ethiopia	Sierra Leone
Gambia	Somalia
Ghana	Sudan
Guinea	Tanzania
Guinea-Bissau	Togo
Kenya	Uganda
Liberia	Zambia
Madagascar	Zimbabwe

Appendix 2. Debt to GDP Ratios %



AN ECONOMIC MODEL FOR DISTRIBUTING BODY ORGANS

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ABSTRACT

The science of economics is being called upon to offer potential solutions to many of the current problems in our health care delivery system. An area where economic analysis may be very useful is in the shortage of body organs for transplantation. The demand for body organs is far greater than the supply of body organs which results in thousands of individuals dying every year as a result of this market shortage.

The supply of organs comes from living donors and cadavers and has remained in short supply over the years requiring rationing of these vital organs. The shortage of body organs cannot be met by donors alone. According to Feldstein (2007) between 1995 and 2005, 62,367 people waiting for a transplant died during their wait. Since the purchase of organs is illegal the majority of organs are received through the altruism of donors.

This paper will examine the economic value that could be gained by allowing the market forces of supply, demand and price to determine the allocation of resources; in this case much needed body organs. The paper will also be sensitive to the ethical questions that would arise if this type of economic market would ever become a reality.

INTRODUCTION

According to Fuchs, (1998) there are three major problems evident in our health care delivery system in this country. These problems are cost, access and health levels in this country. He goes on to explain that these problems are real symptoms of a number of real economic problems found in the delivery of health services to most Americans. I would like to add a fourth problem to this list that includes the inability of the health care system to supply needed body organs to ill individuals causing thousands of deaths every year. Like Fuchs, I believe this shortage of body organs in America is not the problem but a symptom of the need for the availability of a market for body organs. This is an area where intense economic analysis may be very useful in offering solutions to the shortage of body organs for transplantation.

This type of analysis involves normative economics which includes policy economics. In other words, should there be a policy concerning the availability of body organs through a market mechanism that would involve the price system. These decisions involving medical care are part of the larger field of health economics. Getzen (2007) points out that health economics involves 'value judgments', scarcity issues and trade-offs. They

also involve trying to make the health care delivery system become more efficient in the allocation of scarce resources. Rinehart (1988) argues that the price system in a capitalistic system plays a crucial role in keeping supply and demand equal, thus avoiding shortages. These same market forces can solve the shortage of body organs in the United States if they were allowed to work freely and without government regulation.

The science of economics focuses on the price system and the market forces of supply and demand to bring scarce resources to buyers who can afford the price. This system of capitalism has worked very well in making the United States the richest nation in the world today. Economic markets are capable of solving shortages of body organs and seem to be the only solution to helping very ill individuals acquire the body organs that they need to live. According to Greenspan, (2007) the system of capitalism works best under an economic system based on competition. Authoritarian rules, including laws and regulation that prevent competition, make it very difficult to resolve problems created by market imperfections. Therefore, the free capitalistic system works best at avoiding shortages of resources.

The basic economic problem is how to allocate scarce resources in order to satisfy human wants. According to Getzen, (2007) the focus of economic analysis is on the market, that includes buyers and sellers who get together to determine a price for goods and services. This market usually results in a mutual agreement between buyers and sellers that makes each side of the market satisfied with the transaction. Getzen, (2007) also argues that even though economic theory has evolved to examine health issues it is still only one piece of the picture. Therefore, even though economics drives many health decisions there is much more to health care decisions than pure economic theory. Economics can still be a very useful tool in deciding who should receive scarce resources available from our two trillion dollar health care delivery system.

The market is the point at which buyers and sellers exchange dollars for goods and services. The price of the good or service is determined by the equilibrium between demand and supply. The fundamental theorem of exchange demands that both parties must be benefiting if they freely agree to make a trade. Can the system solve the shortage of body organs that can save the lives of thousands of Americans every year?

RATIONING OF ORGANS

The National Organ Transplant Act of 1984 made it illegal to offer or receive payment for organ transplantation. A black market for the purchase of body organs has developed but demand still exceeds supply requiring a rationing system for the available organs. The United Network for Organ Sharing (UNOS) reports a waiting list of candidates for organs is 97,534 individuals and the donors as of January 2007 were only 7,170. It is clear that the market forces for organ donation are not working as evidenced by the critical shortage of organs available for patients in need.

The UNOS under contract with the U.S. Department of Health and Human Services maintains a centralized computer network of available body organs. UNOS links procurement operations and transplant centers together. The individual in need of a transplant is referred by a doctor for evaluation. If the center makes the determination that the patient is a candidate for a transplant, the patient's medical profile is added to the national waiting list for possible organ transplants. When an organ is located, a list of potential recipients is produced by the computer. A number of medical factors are utilized along with location to determine the recipient of the organ. A large number of individuals die while waiting for the phone call.

McLaughlin and McLaughlin, (2008) point out that when transplants were first made available it was obvious that there would be a shortage. Medical committees were established at hospitals doing transplants to ration the available organs. The power of markets to deal with the supply and demand of body organs was totally ignored. This resulted in ethical decision making allowing the shortage of organs to grow and individuals to die waiting for an organ that they would never receive. Price controls and rationing systems have been tried in the past and they have never worked. The market system usually comes to the rescue and the shortages disappear.

Bodenheimer and Grumbach, (2005) consider rationing to include limiting care due to scarce resources and utilizing a fair method to distribute these scarce resources that are currently available. Rationing does not use an economic market and price system to work in the distribution of scarce resources. Not only must the outcome be perceived as fair, but so should the process that produced the outcome. It does not seem that anyone is satisfied with the current rationing system for body organs.

ECONOMIC APPROACH TO THE DISTRIBUTION OF ORGANS

Goodwin, Nelson, Ackerman and Weisskopf, (2005) argue that markets are best because resources will not be left idle and resources will always be put to their most valuable use. The development of a market for body organs free of legal restrictions will increase the incentive for individuals to donate their body organs. McConnell and Brue, (2007) argue that prices that are fixed by law block the operation of the price system causing a distortion in the allocation of resources.

The problem is that the demand for body organs is far greater than the supply of body organs which results in thousands of individuals dying every year as a result of this market shortage. The demand for transplants has increased because of the use of immunosuppressive drugs to reduce the risk of rejection. The supply of organs comes from living donors and cadavers and has remained in short supply over the years requiring rationing of these vital organs.

Feldstein, (2007) argues that the demand for body organs for transplant purposes is outpacing the available supply of these organs. Between 1995 and 2005 the demand for organs increased 121 percent while the supply increased by only 45 percent. This left over

50,000 people waiting for the availability of a body organ required to save their life. Feldstein, (2007) points out that more than 70 percent of these individuals are waiting for a kidney. The laws against selling body organs are simply forcing the rationing of organs and the development of a secondary black market for organ purchase.

Feldstein (2007) also points out that the number of transplants is increasing each year, the gap between those waiting for organ transplants and the supply of organs has been growing rapidly as more patients are being recommended for such transplants. Without any incentives for donors or physicians and hospitals to recruit donors, the shortage of organs will become more severe. Supply and demand factors for body organs have actually been made worse through medical progress. Preventive measures in car safety and design have reduced deaths from automobile accidents while better drugs have made demand increase while the increase in diseases like Hepatitis C and Cirrhosis have increased the demand for some body organs like livers.

For this reason, there is a real need for a market for body organs for transplant purposes. This market will consist of a very large number of potential buyers of body organs and an almost equal number of potentially available body organs every year. The problem will only be solved by allowing the economic market system that distributes other goods and services in our country to work with organ supply.

There are several possible donor compensation models under discussion. These proposals include: compensating families of donors, compensating donors before death and offering incentives to physicians and hospitals to pressure families of dying relatives to consider donation of family member's organs after death of their loved one. These models all involve paying for body organs which would probably allow wealthier individuals to have a greater opportunity to receive the body organs. Many economists argue that the incentives to encourage the requisite number of organs to meet supply are not in place and that is why a severe shortage of desperately needed body organs exists. This shortage will not be solved through medical science or altruism but through economics.

Doctors could help the shortage if they would be more aggressive in discussing the issues with family members of terminally ill patients. Again, monetary incentives come into play in order to motivate physician and hospital to become more aggressive in securing agreement from family members on organ donation of their terminally ill family members. Getzen (2007) discusses the concept of "hassle costs" as they relate to physicians discussing organ donation with family members of dying patients. Emergency room doctors, neurosurgeons and internists present at death who find it burdensome to speak with the families and try to get them to agree to donate their loved ones' organs. Taking time to explain the issues, dealing with the emotional distress, and facing frequent refusals are costs for which they obtain no direct benefit. They are a disincentive that greatly reduces the number of organs made available for transplant.

Cohen, (2005) has suggested that a sum of money be paid to individual's estate or designee upon their death if they donate their organs so that someone else can live. Rinehart, (1988) points out that placing a price on body organs would incentivize supply and increase

the number of organs available to those who could afford the market price. Granted, this would eliminate many who could not afford the price from receiving an organ they are already excluded from the market because they cannot afford the medical costs associated with the transplantation process. No capitalistic market is ever perfect but at least the market mechanism eliminates shortages.

Other possible methods could include allowing individuals to sell the rights to their organs in return for a reduction in their health or auto insurance premiums. The most controversial approach for increasing the supply of body organs is to pay living donors a sufficiently high price for them to part with one of their kidneys.

David Meltzer, Assistant Professor of Medicine with the Harris Graduate School of Public Policy argues that another way to increase the supply of body organs would be getting family involvement in the donation of body organ from a loved one who has died. Hansmann, (1989) argues for the development of a futures market for body organs. This would require that the rights to body organs would be purchased from an individual while he or she is still alive.

EXTERNALITIES OF THE ECONOMIC APPROACH

There are those who argue that a market for body organs will not work. Since markets work quite well in 95 percent of our capitalistic economy. I question that conclusion since we have never attempted to alleviate the organ shortage through market forces and the price system.

Williams and Torrens, (2008) points out that rationing organ transplants is a matter of significant ethical concern because fewer organs are available for transplant than needed for the 85,000 people on waiting lists for organs. Zutlevics, (2001) argues that support for the development of a market mechanism for the supply of and demand for body organs is growing.

Oswald, (2001) points out that the organ shortage is a very serious problem that must be addressed with new ideas. These new ideas need to come from economics and not medicine or philosophy. Voluntary donations are not working because most people do not want to think about their future death. In fact, they do not even want to consider their possible need for long-term care through a nursing home. Body organs are currently given away by individuals who receive only the satisfaction of knowing that they may have saved someone's life. Making matters worse the precious organs are then rationed to those who have a demand for the organs. An externality to the questionable system of rationing is the development of a black market where only the wealthy or politically connected can acquire the life saving organ.

There is no question that ethical issues are involved in the development of an economic model to increase the supply of available body organs. The ethical principles of distributive justice are designed to guide the allocation of the benefits and burdens of

economic activity. This would include strict egalitarianism, which advocates the allocation of equal material goods to all members of society.

There are market failures found in our health care delivery system. One of these failures that occur because of an imperfectly competitive market is externalities or spillover effects because of economic activity. Morris, Devlin and Parkin, (2007) argue that externalities may be good or bad and are the result of costs and benefits of the production of goods and services in a market that are not absorbed by the demanders and supplies in a market.

This market cannot be used to exploit the poor. Therefore, if an organ market is to develop, information needs to be readily available to all about the pluses and minuses of such a market.

There also needs to be more information made available for prospective donors to make decisions about donating organs and the transplantation process. Truog, (2005) argues that there needs to be a standardized process for evaluating potential donors and the availability of information to help donors make an informed choice.

These external costs occur when some members of society are affected adversely by market transactions. These spillover costs are quite capable of appearing in a market for body organs that is controlled by the price system. There are several potential negative economic effects in the use of an economic market to secure body organs. They include: the fact that all Americans would not be able to afford the equilibrium price required to secure a needed body organ. The market may destroy altruism ending the practice of voluntary donation of body organs. Hansmann, (1989) argues that the market could actually create a surplus of body organs.

DISCUSSION

There are those who believe that the purpose of the development of the science of economics was to save lives. Health care economists are asked to assess economic efficiency, in other words, how well the health care system has used the resources available to achieve its stated goals

Thousands of Americans die every year waiting for a body organ that does not arrive in time to save their life. It is very clear that the current policy regulating supply of body organs and then rationing them to fortunate individuals is not working. The market system must be allowed to work by unleashing the forces of supply and demand through the operation of the price system. There is a need for new ideas to make organs available for transplantation purposes in order to save lives. There are enough natural deaths every year to meet the demand for body organs by sick people.

There is no question that ethical issues are involved in the development of an economic model to increase the supply of available body organs. The ethical principles of distributive justice are designed to guide the allocation of the benefits and burdens of

economic activity. This would include strict egalitarianism, which advocates the allocation of equal material goods to all members of society

Koenig, (2003) argues that the moral status of the transplantation enterprise needs to be debated before society allows body organs to be bought and sold in a market. This debate needs to be held and externalities of such a market must be revealed. Once the debate ends, maybe we can get on with a rational solution for the shortage of body organs resulting in so many needless deaths every year. It is time to end the debate and allow the market to eliminate the shortage.

To make it illegal to buy or sell a body organ because it may make some people uncomfortable is just not an acceptable reason for rationing the gift of life. Morris et al., (2007) argue that if having a market for body organs is wrong is it not equally wrong to allow premature death because of a shortage of organs that could have been averted by market forces.

The debate concerning the allowing a market for body organs to develop pits economic incentives against ethics. The question becomes “can fair and equitable market develop that would increase the supply of body organs available for desperately ill individuals?”

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MACROVARIABLES IN DETERMINING THE EXCHANGE OF THE U.S. DOLLAR AND MAJOR CURRENCIES

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ABSTRACT

Purchasing Power Parity and Interest Rate Parity are well established theories of exchange rate determination. Purchasing Power Parity is basically the law of one price, a basket of goods and services are priced in one country, and the same basket of goods and services are priced in another country and the exchange rate is determined based on the price of the commodity basket in each country. Interest Rate Parity is another theory which states that the Interest Rate Parity determines exchange rate. This paper finds that although Purchasing Power Parity and Interest Rate Parity are well established theories of exchange rate determination, there are other variables which are unique for each country for determining exchange rate for those individual countries. In the case of the U.S. dollar it was found that there are some macrovariables which determine the exchange rate of the dollar against its major trading partners. Therefore we cannot say that exchange rate of every country is determined by Purchasing Power Parity or Interest Rate Parity alone. This paper finds that there are some macrovariables that determine the exchange rate of the dollar against some major currencies.

INTRODUCTION

The most well established theories of exchange rate determination are Purchasing Power Parity and Interest Rate Parity. If the absolute Purchasing Power Parity holds, this means that exchange rate is determined by relative prices in two countries and there would be no opportunity for arbitrage profit by speculating in the foreign exchange market. It has been found that although Purchasing Power Parity holds in the long run between the United States and other industrialized countries, Purchasing Power Parity does not hold between the United States and other developing countries. Therefore, there is reason to believe that exchange rate is determined not only by Purchasing Power Parity but there are other variables which are unique to each country for determining exchange rate. The absolute form of Purchasing Power Parity implies that if exchange rate changes deviates from PPP it affects

the competitiveness of a country in international trade (Haque, 2003). Empirical studies failed to prove PPP holds, nevertheless, it remains a valid theory for Academicians and practitioners. If you are planning to take a job in Bangladesh, converting your U.S. salary into Bangladesh taka, it will not give you the true purchasing power, because cost of living in Bangladesh may be significantly lower. Most of the empirical study on Purchasing Power Parity has given negative results; therefore, this study tries to find what variables are important in determining exchange rate for each individual country. The results clearly indicate that even within the OECD and European Union countries there is significant difference in cost of living in different countries (Vachris & Thomas, 1999).

The theory of Interest Rate Parity holds that one cannot make arbitrage profit by speculating in foreign exchange market due to different interest rate in different countries. Let us say for example that interest rate is 8 percent in the U.S. and 6 percent in U.K. Investors in U.K. will want to transfer funds to the U.S. to invest at the higher prevailing interest rate. Suppose they have a 3 month investment horizon, at the end of 3 months the pound will appreciate against the dollar. Because of the depreciation of the dollar, the U.K. investor will receive fewer pounds which will wipe out any gain made from the higher interest rate in the U.S. Therefore, the British investor will not be any better off by investing in the U.S. to take advantage of the higher interest rates. In order for the British investor to make any gain, the investor buys dollar in the spot market and sells dollar in the forward market. The opportunity to make this arbitrage profit will induce all British investors to buy dollar in the spot market and sell dollar in the forward market. This will cause an appreciation of the dollar in the spot market and depreciation of the dollar in the forward market until equilibrium is reached and arbitrage profit is wiped out. In a study it was found that although Interest Rate Parity holds for the most part between the U.S.A. and other industrialized countries, it does not hold between the U.S.A. and developing countries, therefore it is possible to make arbitrage profit in foreign exchange speculation through covered interest arbitrage (Haque, 2003). Uncovered Interest Rate Parity suggests that existence of different interest rates in different countries can be explained by expected changes in exchange rates, although, empirically this theory does not hold (Micheal & Christensen, 1999). Therefore, one could reasonable argue that there are other factors besides interest rates that influence exchange rate determination.

Since it is found thus far that neither Purchasing Power Parity or Interest Rate Parity alone or combined determines exchange rates, there are other variables that are unique in determining exchange rates for different countries.

This study was undertaken to determine whether the exchange rate of the dollar is dependent upon some macrovariables, especially against its major trading partners Canada, Europe, Japan and also the SDR. The study found that in all of these cases the exchange rate of the dollar against these currencies depends on some U.S. macrovariables. Similar studies were undertaken to determine the exchange rate of the British pound against its major trading partners.

METHODOLOGY

Data were collected and compiled on the following macrovariables for the United States economy: Gross Domestic Products, exports, imports, national income, personal consumption, personal income, farm income, corporate profits and unemployment for the years 1997 to 2006.

Similarly, data were compiled on the exchange rate of the dollar against major currencies: Japanese yen, Euro, SDR, and Canadian dollar for annual average from 1997 to 2006. The direct quote was used for the regression. The macrovariables were used as independent variables and the exchange rate between each currency and the U.S. dollar as the dependent variable. A separate regression was used for the macrovariables and each of the major foreign currencies.

In multiple regression backward elimination was used which is largely a trial and error procedure to derive the best regression estimates. This involves computing a regression equation with all the independent variables, then going back and deleting independent variables which do not contribute significantly.

LITERATURE REVIEW

In an article regarding theoretical issues in exchange rate determination, it discusses the ability of the sticky price general equilibrium model in explaining the behavior of nominal and real exchange rate. It shows that structural macroeconomic models are unsuccessful in explaining exchange rate movements. Three popular structural models of exchange rate are flexible price monetary models, sticky price monetary models and portfolio balance models. These models show that an unanticipated money supply increase will increase welfare in the short run because money supply shocks lead to increased consumption leading to higher output levels. The main feature of these models is the fact that there is no deviation from Purchasing Power Parity even in the short run (Crosby & Voss, 1999).

Empirical evidence has shown that the speed at which prices and interest rates transmits is not fast enough to keep parity in the short run with the foreign exchange market. Current exchange rate models ignore future exchange rate behaviors. It is believed that gold price movements have great explanatory power with respect to exchange rate movement. Gold price data is used because it is considered a highly homogenous commodity and is continuously traded in all markets. It is empirically shown that the exchange rate between Europe and U.S./Japan have a significant effect on U.S. gold prices. However, the article proposes a relationship between stock return and exchange rate. It was found that a weak positive relationship existed between real stock return differentials and changes in the real exchange rate over the 1979 to 1983 period. Therefore, they conclude return in share market and return in foreign exchange market move together. Because share prices adjust quickly to new information, therefore, it should be used in models for exchange rate determination.

Because a depreciation of a currency leads to higher exports and therefore to higher corporate profits, it can be said that there is a relationship with share market and exchange rate. Since depreciation of a currency leads to higher share market return, therefore, it is concluded that there is a relationship between stock market return and exchange rate (Ong & Izan, 1999). In a study about exchange rate hysteresis the author develops a theory of exchange rate that hysteresis generates through hysteresis in the current account. It is found that trade account hysteresis leads to hysteresis in exchange rate and vice versa. Trade account is an important variable in determining exchange rate (McCausland 2000). Papadopoulos and Zis in discussing the flexible monetary model states that the model is based on the assumption of Purchasing Power Parity hold constantly and demand for money functions of the domestic and foreign economies are stable. They wanted to find whether there is a long run equilibrium exchange rate between Drachma and the ECU. In testing the order of integration, they employed Augmented Dickey Fuller (ADF) and Phillips-Perrons (PP) tests. They identify a quadratic trend. For analyzing the determination of the Drachma/ECU exchange rate, a four equation parsimonious VAR was used. They determined a well defined exchange rate equation which was not satisfactory in the short run. The results were consistent with monetary approach of exchange rate determination. Although the findings are satisfactory, the usefulness of the model is limited because the sample period is short and extends only to 1991. However, the findings do establish the monetary approach to exchange rate determination (Papadopoulos & Zis, 2000).

Coakley and Fuertes in discussing the application of linearity test in estimating nonlinear models, the findings show that in the presence of transactions costs, real exchange rate adjusts towards equilibrium in a nonlinear way. Their study suggests that nonlinearities because of transaction cost is consistent with PPP. In doing the nonparametric cointegration analysis the real exchange rate has been defined as the nominal exchange rate deflated by relative price indices. They use Phillips-Perron (PP) test where the data were nonstationary and Bienens and Guo test where the data were stationary. They used the limit root tests on the nominal exchange rate. Then, they used the mean reversion to see if real exchange rates and relative prices are cointegrated with vector. They did this analysis on 18 OECD countries and found cointegration in eight of those countries. Bienens test showed evidence of cointegration for 15 out of 18 countries based on CPI. However, cointegration is rejected for five of those countries. The article shows that nonlinear real exchange rate adjustment is valid (Coakley & Fuertes, 2001).

Tawadros in his study tests the predictive power of the monetary model exchange rate determination using cointegration based error correction model and finds that the model performs better than random walk model. Literature is cited which tested the validity of the monetary model using regression based methodology. It is suggested to use the Johansen technique, because of its proven success for the monetary model. It has proven successful in studying the back market exchange rate data for Pakistan, India and Sri Lanka. Johansen have developed a multi-variate technique which provides maximum likelihood estimates on all the cointegrating vectors which might be in existence between all variables. Johansen

method estimates the vectors directly which is otherwise not possible using conventional methods. It allows direct hypothesis testing of all the coefficients which enters the cointegrating vectors. However, its drawback includes the ambiguity of how to interpret when more than one cointegrating vector is found. Another weakness is the lack of separating the variable into endogenous and exogenous categories. In the study Dickey-Fuller and Phillips-Perron tests were used for testing the nonstationarity. The study found a single long run relationship between exchange rate, money supplies, industries output and short-term interest rate (Tawadros, 2001).

Stemp examines the impact of monetary and fiscal policy on exchange rate. He discusses the two well established theories of exchange rate determination, Purchasing Power Parity and asset market approach which is also known as interest rate parity. Fiscal policy and exchange rate is discussed in the context of IS/LM and balance of payments context. Expansionary fiscal policy leads to increased government expenditure or reduction of taxes. This leads to an increase in the aggregate level of demand for output at specific interest rate. This causes a rightward shift of the IS curve. This will induce foreign capital inflows which will lead to an appreciation of the domestic currency. This will reduce exports. Appreciation of the domestic currency and the reduction of exports will continue until the IS curve shifts back to its original long-run equilibrium. Therefore, the impact of an expansionary fiscal policy is neutralized by an appreciation of the domestic currency. The opposite will be true of a contractionary fiscal policy which will lead to a depreciation of the domestic currency. Expansionary monetary policy takes effect either by increasing monetary aggregate as reduction in interest. From the context of IS/LM and balance of payments, a reduction in domestic interest will lead to asset flows causing a depreciation of the domestic currency and increase in exports. This will continue until IS/LM equilibrium is restored at a higher level of output. In other words, if the Federal Reserve reduces interest rates, the Bank of England will also have to reduce interest rates to avoid an appreciation of the British pound against the U.S. dollar (Stemp, 2001).

In discussing the effect of news on exchange rates, Newley in his study allows for risk averse investors, makes adjustment for nonstationary data, which is determined using vector autoregressive approach and news is used in a more general way. News variables include money supply, real income and interest rate. Two different methods were used to compensate for the risk premium panel data and GARCH. Results from both techniques indicate that there is no relationship between news and exchange rates (Newley, 2002).

Camarero in a study of the IMP fiscal impulses and the determination of the real exchange rate of the Spanish peseta applied the Keynesian asset model for determining real exchange rate. The findings show that IMP fiscal impulses are not useful in determining real exchange rate with the exception of pound sterling and two vectors (Camarero, 2002).

Petrovic and Miladenovic in their study find that monetary model of exchange rate does not work in time of hyperinflation. They present the case of Yugoslavia during its period of hyperinflation. Usually it is assumed that domestic money supply and demand sets prices and Purchasing Power Parity sets the exchange rate. However, in times of

hyperinflation, the public bases its decision on exchange rate rather than prices. All prices and incomes are expressed in foreign currency rather than domestic currency. Public uses foreign currency in determining domestic money holdings. Their results show that exchange rate is determined by the expected future growth of money supply and it is set in the money market. The findings suggest a modified monetary model of exchange rate determination in periods of hyperinflation (Petrovic & Milad). Most of the literature review centers around Purchasing Power Parity and Interest Rate Parity. One important consideration should be cash flow in and out of the country. The model presented here takes into account this important factor of cash flow.

The exchange rate is usually defined as the relative price of two assets: domestic money and foreign money. A number of theories explore determinates of exchange rates.

Flexible Price Monetary Model

The flexible price monetary model assumes continuous absolute purchasing power parity, uncovered interest rate parity, perfect asset substitution, equilibrium in the goods, labor, and foreign exchange markets. Taylor (1995) notes that there are six aggregate markets in open economy macroeconomics: money, goods, labor, foreign exchange, domestic non-money assets, and foreign non-money assets. With equilibrium being assumed in the other major markets, the supply and demand for money becomes the primary focus of the monetary model.

Purchasing Power Parity (PPP) is based on the theory that in *efficient markets* goods have the same prices wherever they are purchased. The exchange rate that brings about this purchasing power parity is referred to as the real exchange rate and is equal to the ratio of the national price levels of the two countries. Empirical studies find some support for long-run purchasing power parity (Taylor 1995).

Efficient Markets are a necessary assumption of PPP. There are various forms of market efficiency, but all require market participants to have rational expectations. Weak form efficiency implies that information from past exchange rates are incorporated into the current spot exchange rate thereby eliminating the possibility of profitable trading strategies based on past exchange rate movements. A stronger form of efficiency would indicate that all available information is reflected in the current spot exchange rate.

Caves and Feige (2001) perform several tests of market efficiency relative to exchange rates. They conclude find evidence that supports the weak form of market efficiency with respect to the U.S.-Canadian market. Beyond past prices alone, they also find that the relative level of US and Canadian stock of money cannot be used as a leading indicator for the exchange rate.

Interest Rate Parity is a theory that the differential in the interest rates of similar interest bearing assets of two countries is equal to the differential between the contractual forward exchange rate and the current spot exchange rate. This condition eliminates the

possibility of earning riskless profits from the interest rate differential. Uncovered Interest Rate Parity assumes risk neutral investors; therefore the risk premium is zero.

Sticky Price Monetary Model

Dornbusch (1976) originated the sticky-price monetary model. This model assumes goods prices do not change instantaneously, but are sticky. Purchasing power parity holds in the long-run, but the model allows for deviations from PPP in the short-term. The sticky goods prices impact real and nominal exchange rates as these overshoot their long-run equilibrium rates to compensate for the sticky goods prices. As goods prices move to their equilibrium, exchange rates also revert to their long-run equilibrium levels (Taylor 1995).

Equilibrium Models

The equilibrium model relaxes the assumption of perfect substitutability of foreign and domestic goods. Agents in this model have clear preferences. Whereas the focus of the monetary models is solely on the supply and demand for money, equilibrium models focus on demand for both goods and money. The degree of substitutability between foreign and domestic goods determines the size of the effect due to goods. A number of studies have shown departures from purchasing power parity. Stockman (1980) presents an equilibrium model of the determination of exchange rates in which deviations from purchasing power parity and exchange rate volatility can occur within an equilibrium framework.

Portfolio Balance Approach

The main difference between the portfolio approach and the monetary models is that the portfolio balance approach assumes imperfect substitutability of domestic and foreign assets. The exchange rate is determined by all foreign and domestic assets, monetary and non-monetary.

Goodman (1982) presents a portfolio model for a bank optimization of foreign exchange activities. The model incorporates foreign exchange behavior and other variables such as default risk and the market price of risk. Increased participation in foreign exchange market and risky assets increases default risk. Increased default risk increases the cost of borrowed funds. The model demonstrates why it is profitable for some banks to enter the foreign exchange market and not profitable for others.

Effects of Relaxing Exchange Rate Model Assumptions

Honohan (1984) looked at the effects of a sudden reduction in the rate of monetary expansion on exchange rates and interest rates using a number of different models. Assuming rational expectations and risk neutrality the nominal interest rate will fall. Speculators who

have rational expectations, but are risk adverse, will moderate the overshooting of exchange rates and the reduction of interest rates. In the final model rational speculators are allowed to make transitory errors in forecasting the long-run equilibrium. The allowance for transitory forecasting errors leads to a pattern of an initial increase in nominal interest rates and a gradual response of the exchange rate. This result is similar to the observed behavior of exchange rates.

Recent empirical work indicates long-run elasticities are generally about twice as large as short-run. Bhandari (1983) suggests these results indicate that adjustment of aggregate demand to a change in terms of trade is a dynamic rather than static process. Bhandari constructs a simple macro-dynamic model of the economy which incorporates the lags involved in complete adjustment of aggregate demand to a given change in terms of trade and interest rates. The model assumes flexible prices, continual commodity market equilibrium, a perfectly integrated capital market, a partially integrated commodity market, and endogenously determined domestic currency price of exports. The model predicts that monetary disturbances will cause more relative volatility in the spot exchange rate than real disturbances.

Most models assume there is no uncertainty in the purchasing power of the currencies. Stulz (1984) expands the literature on exchange rate determinants by investigating the effect of purchasing power risks on exchange rates. Stulz models a number of macro variables that indicate the relative uncertainty present in a particular economy. The theory postulates that when the purchasing power of the domestic currency is riskier than the purchasing power of foreign currency, the ratio of foreign money held relative to domestic will be greater. Therefore, changes in the purchasing power risks of two currencies will affect the exchange rate.

He and Subhash (1997) expand the basic monetary model to allow for currency substitution. Foreign and domestic residents can hold the currency of the other country. The demand function for money includes money supply, price level, industrial production, and the domestic interest rate. The authors conclude that the model is a valid long-run exchange rate determination model for some of the currencies tested and currency substitution is an important factor.

A Canada/United States exchange rate equation developed by Amano and van Norden (1993) performs well over the 1973–1990 estimation period. It continued to perform well for an additional 13 beyond the estimation period. The dependant variable is the nominal Canadian/U.S. exchange rate deflated by the gross domestic product price indices for Canada and the United States. Variables include an energy variable, a non-energy commodities variable, and the spread between U.S. and Canadian 90-day commercial interest rates. The model does not perform well after 2003. Possible explanations for the change in the performance include changes in the proportion of Canadian exports that are energy related, the growing U.S. current account deficit and currency depreciation, and different rates of growth in productivity between the U.S. and Canada. Models adding a variable for each of

these possibilities significantly improve the model's performance. However, combining all three variables with the original equation has not been successful (Bailliu 2005).

Table 1 Exchange Rate Models and Assumptions

	Basic flexible price monetary model	Basic sticky price monetary model	Equilibrium model	Portfolio balance approach	Efficient market
Assumptions:					
Risk neutral	X	X			X
Rational Expectations	X	X			X
Flexible prices	X				
Uncovered interest rate parity condition	X	X			X
Continuous purchasing power parity	X	PPP in long run only			
Perfect substitutability of foreign/domestic goods Equilibrium in Goods market	yes	yes	Differentiate between goods		
Perfect substitutability of foreign/domestic assets	yes	yes		Imperfect substitutes	
Equilibrium in labor market	yes	yes			
Equilibrium in foreign exchange market	yes	yes			
Currency substitution	Generally no	Generally no			
Results of Empirical Tests:					
Does the model outperform a random walk	Generally no	Generally no			
Results of other empirical tests	Evidence weak beyond late 1970s	Evidence weak beyond late 1970s	Weak support	Poor results	Some support for weak form

A number of studies look to the behavioral and psychological literature as a possible answer for unexplained movements in exchange rates. Harvey (2006) looks at the type of behavior expected of agents and the limitations of market participants. The cultural environment that agents operate in has significant influence on their decision making which can lead to bandwagon effects and other 'irrational' behavior.

RESULTS OF THE REGRESSION

For the exchange rate between the Japanese yen and the U.S. dollar all variables seem significant except GDP, with a R^2 of .956.

For the exchange rate between the Euro and U.S. dollar all variables were significant except GDP and unemployment rate with a R^2 of .999.

For the exchange rate between the U.S. dollar and SDR all variables except GDP and unemployment rate with a R^2 of .996.

For the exchange rate between U.S. dollar and Canadian dollar all variables except GDP were significant with a R^2 of .995.

	R2	F	Sig.
Regression with:			
Can \$	0.995	50.789	0.019
SDR	0.996	96.157	0.002
Euro	0.999	367.346	0
Yen	0.956	5.444	0.164

From the above table it is apparent that all the regression gave very good fit. Because Can \$, SDR and Euro have very high F value and the significance of the F value tells us that it is almost impossible to come up with such a high F value by chance. Only in the case of the Japanese yen the model seems weak because of the low F value and the significance is pretty high.

It is clear from the table the multiple regression between the dollar and the Canadian dollar, SDR and Euro gave us a very strong model and based on the F value and its significance, these three models are fairly accurate for predicting exchange rates. In the following regression models the variables are:

X_1 = Gross Domestic Products

X_2 = Exports

X_3 = Imports

X_4 = Personal Consumption

X_5 = Personal Income

X_6 = Farm Income

X_7 = Corporate Profit

X_8 = Unemployment

X_9 = National Income

$$\begin{aligned}
 \text{Euro} &= 4.260 - 3.198_{X_2} + 1.740_{X_3} + 12.291_{X_9} - 6.143_{X_4} \\
 &\quad - 5.291_{X_5} + .577_{X_6} + .534_{X_7} + .055_{X_8} \\
 \text{Yen} &= .003 + .651_{X_2} + 6.590_{X_3} + 7.632_{X_4} - 13.173_{X_5} + .340_{X_6} - 1.571_{X_7} - .177_{X_8} \\
 \text{SDR} &= 4.747 - 5.540_{X_2} + 4.875_{X_3} + 14.851_{X_9} - 9.729_{X_4} - 4.740_{X_5} + .680_{X_6} - .105_{X_8} \\
 \text{CAN\$} &= .017 + 1.288_{X_2} - .955_{X_3} + 2.443_{X_4} - 2.511_{X_5} + .305_{X_6} + .347_{X_7} + .165_{X_8}
 \end{aligned}$$

CONCLUSION

Based on the results of the regression it can be said that the exchange rate between the dollar and other major currencies is determined by some macrovariables which include unemployment rates, corporate profits, personal consumption, farm income, exports, imports, personal income and national income.

Usually it is argued that exchange rate is determined by Purchasing Power Parity and Interest Rate Parity. Although the PPP and IRP are valid theories, what the results of this research shows that macrovariables have a significant impact in determining the exchange rates between the U.S. dollar and major currencies.

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AN EMPIRICAL INVESTIGATION OF THE INTERRELATEDNESS OF SELECTED MIDDLE EASTERN COUNTRIES

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ABSTRACT

The Middle East has been a center of attention during the past century. The countries of the Middle East have large reserves of raw materials, especially crude oil. In this article we are going to look at the effects of the Iraq situation on the business cycle of the neighboring countries.

The countries we consider are Iran, Saudi Arabia, Jordan, Syria, and United Arab Emirates. Some of these countries such as Saudi Arabia, Emirates, Syria and Iran are rich in oil resources while others Arab countries like Jordan do not have these natural resources. We will investigate how the Kuwait war in 1992 and the Iraq war in 2003 have affected the economic conditions in these countries, specifically the interrelatedness of their business cycles. The econometric methods of cointegration and common feature testing will be utilized.

INTRODUCTION

The importance of the Middle East has grown substantially over the past fifty years. At the same time, stability in this region has been tenuous at best. The economic condition of the region is as complicated as the cultural and religious environment. Unfolding events over the past fifteen years have brought increased tension and surprising cooperation in the region. Events such as the war between Iran and Iraq in the 1980s and the Iraqi invasion of Kuwait with 100,000 troops in 1990 ultimately led to the first Gulf War. Also, the second Gulf War and ongoing occupation of Iraq by United States has brought change and uncertainty to the region. At the same time there has been surprising cooperation in the region. For example Israel and Turkey have formed a free trade zone.

This article examines the common business cycles between several key counties in the Middle East. The countries include Saudi Arabia, Jordan, Syria, Iran, and the United Arab Emirate. Most of the countries in the region are rich in natural resources mainly crude oil and they rely on the export of crude oil to keep their economies running since the

industrial sector is not well developed. Agriculture although present is a very hard sector to develop due to the extreme climate.

This study examines some oil exporting countries and also some countries like Jordan that enjoy far less abundant resources. Although most borders in the region are closed there are some open borders to create some trade free zones but still they are not open for the outside world. An unfortunate omission due to data limitations is Iraq. Before turning to the empirical evidence regarding the interrelatedness of these countries' economies, we briefly introduce each country.

Jordan is a poor Arab country lacking in oil reserves. Jordan's economy depends on the trade with the Persian Gulf countries. In 1994, Jordan signed a trade agreement with Israel and established the Qualifying Industrial Zone (QIZ). The product manufactured by this industrial park (QIZ) can be exported to the USA duty free provided a 35 percent portion of the product comes from the QIZ, Israel, and/or the West Bank/Gaza. King Abdullah was crowned in 1999 and undertook some economic reforms. These included privatization, attracting foreign investment and debt restructuring.

Jordan's real GDP increased by 3.2 percent in the last quarter of 2003 due to an increase in exports, mainly to the USA. Jordan had a surplus of 11.1 percent of GDP in its balance of payments and the Jordanian Dinar is pegged to the U.S. dollar. Jordan's main exports are phosphates, fertilizers, potash, agriculture products and textiles. Jordan also has a trade agreement with the USA that took effect after 2001.

Saudi Arabia is an oil rich country having around 25 percent of the proved world reserves. Saudi Arabia is the biggest oil exporter in the world. Oil is the main export and accounts for about 75% of budget revenue, 40 percent of GDP and 90 percent of the export earnings. Any fluctuation in oil prices affects its GDP. For example, in 2003 GDP increased due to high oil prices, so fluctuation in oil prices is considered the biggest factor for the economy.

The debt of the country is 100 percent of GDP so the government says that they cannot afford to diversify due to lack of funds. The government encourages foreign investment especially joint ventures with Saudi nationals. A joint venture with Saudi national with at least a 25 % of ownership is eligible for an interest free loan from governmental credit institutions and the corporate taxes are imposed only on foreign investments or foreign portion of the joint venture. The Saudi riyal is pegged against the dollar at the rate of 3.75 riyals per dollar. Saudi Arabia has a surplus in its balance of payments since 1967. The unemployment rate is 15 percent.

Iran is a central based country where most of the major corporations are owned by the government. The Islamic revolution in 1979 had a great affect on the policy making in Iran. Parliament and the Council of Guardians are not in favor of trade liberalization. Like its neighbors Iran is also rich in oil resources. Iran holds 10 percent of the proved oil reserve of the world. Crude oil and oil products are a big part of its exports. Iran is also developing its agriculture sector, which now accounts for 20 percent of its GDP. The service sector stands for 45 percent of its GDP, which makes it the biggest sector in the economy but this

sector faces obstacles such as currency exchange restrictions, time-consuming official procedures and uncertain political situation.

Iran's GDP growth rate was 5.9 percent in 2003 due to high oil prices. The unemployment rate is at 17.8 percent in 2003 as compared to 16.2 in 2002. Iran is not a member of the WTO. It would have to undergo a big transformation in its economic system to qualify for the membership.

The United Arab Emirates (UAE) also has big gas and oil reserves like the other neighboring countries having 10 percent of the world's oil reserves and a fifth of the natural gas reserves. The UAE is more diversified than the other Middle East countries. The country has invested in agriculture, industry and trade. In 2003 the non-oil part of production accounted for 33.3 percent of GDP and more than 30 percent of exports. Most of the development in the UAE happened in the last 30 to 35 years as the per capita income rises from nearly nothing to 27,000 US dollars during this period. The GDP growth was 7 percent in 2003 while in 2002 it was just 1.9 percent due to change in oil prices. The balance of payment surplus was 12.1 billion or around 15.1 percent of GDP. One of the major contributors to this surplus is the trade sector, trade free zone.

As far as the business sector is concerned foreign ownership is very restricted. Even in the limited liability companies, foreigners cannot have more than 49 percent of the ownership stake while in the case of partnerships owners have to be local. The UAE Dirham has been pegged to US Dollar and the rate is 3.67 Dirham per US Dollar. The country has followed this policy since 1980.

Syria, like some of its neighbors, has a centrally planned economy. It has abundant oil resources accounting for 55 to 60 percent of Syria's exports and about one-third of its GDP. Syria has about 800 potential oil sources and 60 percent of them are still unexplored. To date, foreign investors have not shown much interest in Syria. The other important sector in Syria's economy is the service industry providing employment to 45 percent of the labor force and contributes 50 percent to GDP. The agricultural sector still is developing.

Syria's debt equals 100 percent of GDP, which has led to the World Bank classifying it as a lower income and severely indebted country. The debt increased due to heavy military spending and expansion of the public sector. Syria has engaged in efforts to promote free trade. For example, in 2001 it signed a trade free agreement with Iraq that resulted in 1 billion dollars worth of trade between the two countries. Due to this trade agreement, Syria acquired 100,000 barrels of Iraqi oils on favorable terms.

Kuwait is not in the empirical portion of the current study but offers an interesting example of a Middle East economy. It is the most open economy in the Middle East with legislation to allow foreigners to have 100 percent ownership in a company, in certain sectors, having been passed and waiting to be implemented. The government holds most of the interest in the oil and gas industry and after the crashes of 1979 and 1982 the government also has most of the interest in private companies. In August 1990 Iraq invaded Kuwait devastating Kuwait's economy. The government then started to divest itself of the private

companies. The country is still trying to recover from the effect of the invasion with the GDP growth rate being negative in 2001 (-1.10) and 2002 (-0.90).

The Kuwaiti Dinar is determined daily against a basket of currencies but the rate closely follows the US dollar. The Dinar is freely convertible. Foreign investors are not allowed to invest in the petroleum sector. There is no tax on corporations in Kuwait except for foreign firms or the foreign ownership portion of a company. Local firms listed on the stock exchange pay a 2.5 percent tax to the Kuwait Foundation for the Advancement of Sciences. Shuwaikh port was declared a Kuwait free trade zone in 1999. Foreign firms established in this area do not face restrictions like corporate taxes etc.

As far as the stock markets are concerned Saudi Arabia has the biggest while Kuwait has the second largest stock market in Middle East. Additionally, the Dolphin project was approved in 2001. This is a 10 billion US Dollars project to connect the UAE, Kuwait, Oman and eventually Pakistan through pipeline for the exportation and importation of gas.

We can see that oil is a common source of revenue in the Middle East but it is not the only source. The world tends to see the region as a wealthy oil-producing region. The truth however may be far different from perception. Understanding the economic environment of this region is an increasing priority. The prominence of the Middle East has increased over the past fifty years and will continue to be a major influence on world events for the foreseeable future. This study attempts to examine the linkages between these economies and thus have a better understanding of the economic stability of the region.

DATA AND METHODOLOGY

The data is annual GDP data for Jordan, Iran, Saudi Arabia, United Arab Emirates(UAE), and Syria. The source of the data was Global Insight. These countries were chosen primarily by data availability. Data on the Middle Eastern countries was found to be limited. The time span of data available varied for of these countries. Specifically, the time periods for the data for each of the countries were as follows: Jordan (1985-2002), Iran (1966-2002), Saudi Arabia (1968-2003), United Arab Emirates (1972-1998), and Syria (1989-2000).

The existence of a long term relationship among output data will be tested using Johansen (1988) and Johansen and Juselius (1990) methodology for cointegration. The existence of a cointegrating relation would imply a common business cycle since series that are cointegrated can be expressed with a causal ordering in at least one direction. The bivariate pairings that do not demonstrate a cointegrating relation will be subjected to a more stringent test for comovement called common serial correlation feature tests developed by Engle and Kozicki (1993). The finding of a common serial correlation between variables implies at least one way causality and therefore implies the existence of a common business cycle.

The use of cointegration tests is relatively common in the literature and the reader is referred to Johansen (1988) and Johansen and Juselius (1990) for a complete discussion.

Common feature testing is relatively new to the literature and a brief elaboration on the methodology follows.

Cointegration tests investigate long-term relationships by analyzing forms of comovement of variables that are nonstationary. In order to investigate the forms of comovement that are stationary, common features can be analyzed. Common feature testing is performed among stationary variables. Many macroeconomic variables in their levels are nonstationary and are stationary in their first differences (Nelson and Plossner, 1982). Therefore, it is necessary to perform common feature tests on the first differences. Although stationarity tests are performed in the paper, assume stationarity in first differences of the variables we are considering for methodology exposition purposes. The first differences of the logs of the gross domestic product (GDP) variables of the two countries will share a common feature if a common business cycle exists between the two countries. The common feature for which we test is serial correlation. The finding of a common serial correlation feature between two output variables implies at least one-way causality. Therefore, common serial correlation features are interpreted as common business cycles. The finding of such a common feature will indicate persistence and comovement in the system. Common serial correlation will be tested by using the test statistic developed by Engle and Kozicki (1993).

The model for a common feature test between the output level of one country ($y_{1,t}$) and the output level of a second country ($y_{2,t}$) where the common feature is generated by a vector of variable w_t is given by

$$y_{1,t} = c\beta_1 + w_t \gamma_1 + \varepsilon_{1,t}$$

$$y_{2,t} = c\beta_2 + w_t \gamma_2 + \varepsilon_{2,t}$$

In this model, c_t is a constant term and w_t is a serial correlation feature that may be common to both series. The error terms are serially uncorrelated. The linear combination, $y_{1,t} - \delta y_{2,t}$, can be written in the following way:

$$y_{1,t} - \delta y_{2,t} = c_t (\beta_1 - \delta \beta_2) + w_t (\gamma_1 - \delta \gamma_2) + \varepsilon_t$$

If there exists a parameter, δ , such that $\gamma_1 - \delta \gamma_2 = 0$, then w_t is not a component of the linear combination. In this case, w_t is called a common feature. If w_t is a serial correlation common feature, then the linear combination $y_{1,t} - \delta y_{2,t}$ will be serially uncorrelated.

The steps involved in the bivariate common serial correlation test are summarized below. First, test for a bivariate common serial correlation feature test for the existence of the serial correlation feature in the individual series. Second, determine among the pairs identified as having the serial correlation feature as to which of these pairs is the feature due to a common component. That is, estimate the following equation for the pairs identified individually as having the feature:

$$y_{1,t} = c\beta_{LIML} + y_{2,t}\delta_{LIML} + \xi_{LIML}$$

Estimate this equation using the LIML approach where the instrument list is an intercept and the lags of $y_{1,t}$ and $y_{2,t}$. By using the LIML approach the parameter estimate is insensitive to normalization. Then estimate a regression of the residuals from (3) on the lags of $y_{1,t}$ and $y_{2,t}$ given by the following:

$$\xi_{LIML} = c\beta_{OLS} + y_{1,t-1}\gamma_{1,OLS} + y_{2,t-1}\gamma_{2,OLS} + \varepsilon_{t,OLS}$$

The value of the $T \cdot R^2$ from this model is the relevant test statistic, with a chi-squared distribution, of the common feature test as proposed by Engle and Kozicki (1993). Refer to Engle and Kozicki (1993, p.371-372) for details of the test statistic. The null hypothesis of this test statistic is that the linear combination of the variables does not have the feature, that is, the feature is common for the two variables in question. The alternative hypothesis is that the linear combination of the variables does have the feature and therefore the feature is not common between the two variables. Recall if the feature is common, this implies at least one-way causality and therefore a common business cycle.

EMPIRICAL RESULTS

Prior to cointegration and common feature testing, the order of integration needs to be ascertained. The order of integration of the individual time series is determined using the augmented Dickey-Fuller test (Fuller, 1976; Dickey and Fuller, 1981) and a Phillips-Perron test (Phillips, 1987; Perron, 1988; Phillips and Perron, 1988). The unit root tests are provided in Table 1. In all cases, the output variables are found to be nonstationary in levels and stationary in first-differences.

Table 1: Unit Root Tests				
	Dickey Fuller		Phillips-Perron	
	Level	1 st Difference	Level	1 st Difference
Jordan	-.078	-12.56	-0.88	-10.88
Iran	-0.40	-27.43	-.50	-23.60
Saudi Arabia	-0.98	-34.36	-.80	-32.60
United Arab Emirates	-2.24	-9.12	-2.08	-7.60
Syria	-0.67	-17.32	-0.54	-12.45
Note: The critical value at the 90% statistical significance level is 3.43.				

To investigate the comovement among the nonstationary variables in their levels the cointegration test is applied on a pairwise basis. The lag lengths to be used in the bivariate cointegration models were determined by the Akaike criteria. The null hypothesis for the maximum eigenvalue statistic is that there are r cointegrating vectors and the alternative hypothesis is that there are $r+1$ cointegration vectors. The null hypothesis for the trace statistic is that there are r or fewer cointegration vectors and the alternative hypothesis is that there are at least $r+1$ cointegration vectors. The results of these bivariate cointegration tests are reported in Table 2.

Country Pairings	Trace Statistic		Maximum Eigenvalue		# of vectors
	r=0	r=1	r=0	r=1	
Jordan and Iran	14.30	1.02	13.28	1.02	1
Jordan and Saudi	10.82	0.24	10.58	1.02	0
Jordan and UAE	4.21	0.01	4.21	0.01	0
Jordan and Syria	7.13	0.67	6.46	0.67	0
Iran and Saudi	8.38	0.30	8.09	0.30	0
Iran and UAE	8.94	0.40	8.54	0.40	0
Iran and Syria	15.92	0.03	12.89	0.03	1
Saudi and UAE	15.36	5.04	10.32	5.04	0
Saudi and Syria	7.79	1.02	6.77	1.02	0
UAE and Syria	17.73	2.42	15.31	2.42	1
Critical Values-- 90%	13.33	2.69	12.07	2.69	

The cointegration tests reveal that only three of the possible ten country pairings exhibit a cointegrating vector that can be interpreted as a common business cycle. The pairings that rejected the null hypothesis of no cointegrating vector were the following pairings: Jordan and Iran; Iran and Syria; and United Arab Emirates and Syria.

The other seven country pairings (Jordan and Saudi; Jordan and United Arab Emirates; Jordan and Syria; Iran and Saudi; Iran and United Arab Emirates; Saudi and United Arab Emirates; and Saudi and Syria) are subjected to the common serial correlation test as outlined in the methodology section of this paper. In the first step of the common serial correlation test, the individual countries in the bivariate country pairings are tested for the feature (in this case common serial correlation). None of the seven pairings exhibited serial

correlation in both of the data series for the countries investigated. Therefore, the common serial correlation test could not be further investigated.

CONCLUSION

This paper examined the common business cycles between several countries in the Middle East for which data were available. The region is always portrayed as a common area with common economies and common problems. The truth however is very different from perceptions. In fact, the region is as economically diverse as other parts of the world. Not all countries enjoy the luxuries of large oil reserves. Also, countries struggle from their economies being dependent on one major resource. The only countries that exhibited common business cycles are Jordan and Iran; Iran and Syria; and United Arab Emirates and Syria. This is an interesting result because these are the countries that are not dependent on oil as their main or only source of revenue. Of the pairing Iran has the largest oil reserves but has chosen to diversify their economy. It is an even more interesting result that oil production did not tie together economic business cycles between Saudi Arabia and Iran or the UAE. In conclusion, the Middle East is a complicated region with an increasing prominence on the world stage. Understanding the economic forces of this region is an increasingly important and interesting topic. Areas for further research would be to obtain a larger data set and more fully explore the common business cycles of the region.

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