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Teaching Forensic Economics in the University Curriculum

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I. Introduction

According to Brookshire and Slesnick (1999), approximately 53% of the members of the National Association of Forensic Economics (NAFE) who responded to their survey receive some faculty salary. Although this percentage is down from a previous survey (Brookshire, et. al., 1990), this represents a sizable number of individuals.

Despite the rather large number who could potentially teach a course in forensic economics, surprisingly few actually do so. (Approximately 360 members of NAFE hold a Ph.D. in economics or a related field.) According to Toppino, et. al., (2001), a course in forensic economics has only been offered by six instructors at the undergraduate level in the U.S., and most of these have not been offered every academic year. In addition, only two stand-alone courses in the subject are known to have been offered at the graduate level.

The purpose of this paper is twofold. First, we discuss how a course in forensic economics fits into the economics curriculum and helps students develop skills that are currently recognized by economic educators as important for majors, and thus can be a valuable addition to the economics curriculum. Second, we show how forensic economists who teach at universities can use their knowledge and skills in the classroom even if they do not teach a course in forensic economics. By demonstrating how forensic economics can be integrated into other economics courses, we hope to assist and encourage forensic economists to introduce the subject without adding courses to the curriculum.

Specifically, the paper first discusses how a course in forensic economics is an excellent way to develop the type of thinking advocated in the economics education literature over the last 20 years. Even if forensic economics is not used as a stand-alone course, it can still promote a variety of skills considered important such as writing, oral communication, team work, and the challenge of applying economic theory to real-world complexities. The second part of the paper describes the structure of forensic economics courses as taught by three instructors, the authors and Professor Jim Rodgers, Professor Emeritus at Pennsylvania State University. We also demonstrate how forensic economics can be used in existing economics courses such as labor economics and principles of economics. The paper concludes with a summary and conclusions.

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II. Identifying the Proper Goals of the Major in Economics

Siegfried (1998) believes there is broad consensus that the goal of the economics major is to teach students "to think like economists." However, achieving this goal requires more than deductive chains of reasoning in conjunction with parsimonious models to analyze specific problems. It also requires describing the consequences of economic change, amassing data to evaluate real-world events, and making judgments about a variety of policy issues. In short, the literature states that students should not only "think like economists," but "do what economists do."

In addition to foundation courses, Siegfried (1998) indicates that elective courses should attempt to meet breadth and depth requirements. The breadth requirement helps the student apply economic concepts in different institutional contexts.

> The chosen electives should be distributed to ensure an appreciation for the historical, international, and political context of economics. Such breadth will help students avoid a narrow parochial perspective based solely on marginality thinking and should prepare them to deal sensibly with problems that involve other than atomistic models of individual choice. (pp. 68-69)

The depth requirement is designed to get students to really "do economics." This can be a capstone course where students formulate questions, gather information, and interpret and communicate the results of the investigation. Put succinctly, the economics major plows familiar ground but at greater depth as many of the concepts learned in the foundations courses show up in later courses as well. (See Siegfried, et. al., 1991)

The idea of developing a core set of concepts throughout the major parallels Hansen's view that economics majors should become proficient at various levels that become progressively more complex. (Hansen, 2001; Salemi and Siegfried, 1999) These proficiencies range from simply accessing existing knowledge (gathering data from the internet) to creating new knowledge (preparing a research project.) Intermediate levels include displaying command of existing knowledge (elaborate on a current controversy in economics), interpreting existing knowledge (use economic concepts to explain events published in weekly news magazines), interpreting and manipulating existing data (use CPS data to develop and explain age-earnings curves), and applying existing knowledge (write a five-page paper on a current economic proposal).

Salemi and Siegfried believe that the economics major could be significantly improved if "departments stop thinking of the major as comprising a set of individual subjects and begin visualizing it as a process that turns novices into economic thinkers." (Salemi and Siegfried, 1999, p. 358) They recommend that students should be working on empirical projects to help them learn how economists utilize economic data. They also recommend alternatives to the traditional lecture such as writing assignments, cooperative learning, classroom experiments, and use of technology.

Unfortunately, despite the extensive literature that has developed and the increased emphasis on teaching at many colleges and universities, there is little evidence that the recommendations are being pursued. Becker and Watts (2001) describe the results of a follow-up survey investigating teaching techniques at colleges and universities. Both the original survey (Becker and Watts, 1995) and the follow-up survey were designed to examine whether economics instructors were utilizing some of the newer teaching techniques described in the economics literature. (See Walstad and Saunders, 1998, and Becker and Watts, 1996, for a survey of these techniques.) This literature stresses the importance of such techniques as classroom experiments, spreadsheet applications, cooperative-learning assignments and writing across the curriculum.

In the 1995 survey, the results clearly showed that teaching techniques were dominated by the "chalk and talk" approach. It was assumed that, with the significant amount of literature that had been written concerning other approaches and the recent emphasis on the importance of teaching, this result would have changed by the year 2000. But that was not the case. "The median respondent is usually or always lecturing, with the amount of time spent lecturing in all the courses estimated to be 83 percent." (Becker and Watts, 2001, p. 275) Virtually the only type of class discussion was instructor-student interactions. There was minimal use of such innovative techniques as guest lectures, self-assessment techniques (such as the one-minute paper) and small group assignments. Except in statistics and econometrics classes, there was a zero median response to the use of computer labs, computer games and simulations. There was, however, a somewhat higher use for internet data base searches. This rather sad state of affairs was summarized nicely by Becker (1997):

> The picture of an economist lecturing to a class, while he writes on the chalkboard and assigns reading from a textbook, appears accurate for all courses and all institutions, with only a minor caveat for upper-division courses at doctorate institutions. . . .In contrast, class discussion and other forms of active learning, and not extensive lecturing, are now the most prominent forms of instruction used across the rest of higher education. . . .As much of the rest of higher education implements new approaches to teaching, traditional economists may be stuck in the rut of doing to undergraduates what their instructors did to them. In response students may be voting with their feet when they abandon economics. (p. 1354)

The next section shows that forensic economics could be an excellent stand-alone course that naturally lends itself towards the goals articulated in the economics literature. Even the use of forensic economics within other courses such as labor economics, intermediate microeconomics, and principles of economics can add real-world applications and encourage the use of techniques such as classroom writing assignments or group projects.

III. The Forensic Economics Course

The recommendations made to those teaching economics are relatively clear. More concrete applications should be made in the classroom, a range of methodologies used, and the instructor should move beyond the textbook approach. The desire is for students to progress from only reading what economists do, to actually doing economics themselves. But to think like economists, they have to become involved in the learning process with the instructor, other students, and the material.

It has been the experience of the two authors that teaching a stand-alone course in forensic economics is an excellent vehicle for achieving many of the goals of the economics major. The course by Slesnick is outlined here, although it has been discussed elsewhere. (Bartlett and Slesnick, 1999; Toppino, et al., 2001) A description of the courses by Tinari and Rodgers follow.

The course taught by Slesnick at Bellarmine University has been offered five times since 1991. The course is now officially listed in the Bellarmine catalog and is taught once every two years as an economics elective. Enrollment is generally between 25 and 30, although the instructor believes that a class size of 20 would be ideal. Prerequisites for the class are two semesters of principles of economics. There are equal numbers of economics and non-economics majors, with many students aiming towards law school. The link between this course and the economics major is important. The economics department at Bellarmine felt that a forensic economics course must be designed to ensure that basic economic concepts are connected to the analysis of economic loss just as they are connected to the issues in other applied courses.

As an example, the discussion of lost household services starts out by the instructor posing the following question: "Suppose Mrs. Jones is injured and has been a full-time homemaker for the last 10 years. Prior to dropping out of the labor market, she had been a nurse. How would you go about estimating economic damages?" Within a relatively short period of time, the class usually discovers two useful ways of making the estimate. First, the "correct" method would reference the opportunity cost of Mrs. Jones' time in the labor market, perhaps with some adjustment for allowing for a retraining period. Students learn, however, that this approach may be difficult to measure and is relatively subjective. The second approach emphasizes the cost of hiring someone to provide the same service. Although less theoretically correct, it conforms more closely to the relative certainty principle required in court cases. Thus, students link the question to basic economic concepts, but also understand that forensic economics is conducted within a relatively unique institutional setting which must always be considered.

The specific topics covered focus on personal injury and death cases, although another instructor could also bring in cases related to discrimination, the environment, commercial damages, or antitrust. The course also includes a general section on how personal injury and death cases fit into the framework of tort law, and concludes with a discussion of tort reform. However, whenever possible the instructor will bring in more general issues if they are

appropriate. For example, when the value of household services is discussed, the class looks at the issue of average wages of women and men as well as their respective roles within the family. Thus, the topics are expanded well beyond what would normally be of primary concern to a forensic economist when analyzing a particular court case.

Use of readings has been thoroughly discussed in Toppino, et al. (2001). Over the years in Slesnick's course, there has been a change from use of technical forensic articles to more general economics articles discussing labor market trends. The textbook used is *Determining Economics Damages* (Gerald Martin, 2000). Although not designed as a textbook, it is well organized, not overly technical and has many good data sources.

The activities within the course are designed not only to teach students forensic economics, but help them "do economics." Besides the usual in-class tests, one of the most important activities consists of group projects. The class is divided into groups of four. Each group is assigned a different case scenario that collectively cover a variety of interesting situations such as union truck driver, homemaker, minor, professional such as a physician, and retired individual. Each group writes up its case based upon information provided by the instructor and through its own research, primarily through internet resources. The analysis is given to the instructor and another group prior to a group presentation to the class. During the class presentation class members can ask questions, with most of the questions asked by the team that received the report ahead of time. They, in effect, act as the cross-examiners. In the course, two to three iterations are assigned, with each iteration becoming more complex and realistic.

In addition to helping students learn the course material, this type of assignment encourages "economic thinking" and group decision-making. Each group must also do a significant amount of research in terms of gathering information for its case. Groups also learn how to write a well-reasoned paper that clearly explains how they arrived at their conclusions. Students become aware that unless the conclusions are adequately explained and data sources cited sufficiently so the reader can obtain and duplicate their results, the grade will be severely compromised. They are asked to assume that the report is a public document, much as a forensic economist's report is a public document. Finally, class presentations encompass groups presenting their case in a persuasive manner, and for members to think quickly on their feet when asked pointed questions.

For the final exam, groups are reduced to two individuals. One member is considered the "victim" and the other the "attorney." The assignment is to estimate economic loss as if the individual were severely injured and could no longer perform in the intended post-graduation occupation. Each group must write up a report. However, since it is a final exam there are no presentations in class. At this point in the semester, it is assumed that students have acquired the necessary skills to research and write a first-class report. Besides pulling together the information acquired throughout the semester, the final exam allows students to think about the value of their own lives in economic

terms. Calculations require estimation of wages and fringe benefits, household services, and medical costs.

To encourage students to think "outside the box," the final exam has recently required that each group briefly examine a number of extensions. One extension adds the assumption that the student had been a heavy smoker and asks what possible effect this might have on the calculations. Another extension raises the issue of uncertainty when forecasting the future. Future income, household services, and medical costs are uncertain. Other areas of uncertainty relate to the net discount rate and worklife. Students must include in their report how this uncertainty will be incorporated. As a final extension, students must face the reality that estimates are based upon historical data. A hypothetical is provided where the pre-injury income chosen shows clear patterns of wage discrimination between men and women. They are asked how that issue should be addressed. For example, does one use separate wages for men and women, wages for men only for all plaintiffs, or some other combination?

There are a number of other activities that have been used in the course. Several cases are handed out to different groups and are discussed in class. A tape of a forensic economist is shown and then critiqued. Both a plaintiff and defense attorney are invited as guest speakers towards the end of the semester. Students are requested to write up two or three questions for each attorney, a technique that guarantees a lively question-and-answer session.

At Seton Hall University, Tinari has offered a course in forensic economics to juniors and seniors who were economics and finance majors in both the School of Business and the College of Arts and Sciences. The procedure for allowing the Department of Economics to offer this elective course was to utilize a fast-track "experimental course" instead of developing and applying for a new course as a permanent part of the department's offerings. An additional complication was the assignment of credit for a new course and ensuring that it was credited on students' transcripts. The way that was done at Seton Hall was to place the course under the existing Senior Seminar listing (which has a loose, open-ended course description). Furthermore, because the economics major is relatively small, it was decided to offer the course jointly to economics and finance students. Nine students enrolled in the three-credit course.

Finding an appropriate textbook and reading material was a challenge. Gerald Martin's book, *Determining Economic Damages*, was selected as the basic "text" and various articles and papers were put on library reserve while others were handed out in the classroom as required readings. Given that undergraduate students at Seton Hall were not fully prepared to understand and analyze a number of journal articles, only portions of some articles were assigned. The goal of the course was to show students how their economics and finance education could be brought to bear in the real world which, in this case, meant understanding how forensic economics is used in support of litigation.

Major topics covered in the course included the role of the economist in litigation; growth rates and discounting; gross earnings measurement including worklife expectancy; personal consumption expenditures and fringe benefits; valuing household services; life care plans; hedonic damages; and profession-

alism and ethical responsibilities of expert economists. An attorney came as guest speaker and answered students' questions, and a funny yet illuminating video clip of an "expert witness" was shown in the form of Marisa Tomei testifying in the movie "My Cousin Vinny." In this manner, students also began to understand that expert analysis and testimony are a blend of art and science.

Two tests were administered during the semester, and a final exam capped the term. In addition, students were asked to form three teams of three students to prepare and present a completed economic damages report orally and in writing at the end of the course. In retrospect, the course was probably too demanding, given the comprehensive scope of the course and the level of student preparation. The results of the standard student course evaluation indicated mixed reactions to the course. A fair number, although still in a minority, felt that too much material was covered and that certain parts of the topical coverage were too challenging. Others enjoyed developing their own analysis of damages and being required to develop a completed loss appraisal report. If Tinari offers the course again, it will be streamlined in order to focus on essentials, thereby making it more manageable for undergraduates.

On about a half-dozen occasions before his retirement from Penn State, James Rodgers taught a course in forensic economics which, for purposes of the course, was defined as the application of the general theories and methodologies of economics to the measurement of damages and/or proof of liability in litigation. In practice, the subject matter of the course was limited primarily to the estimation of damages in cases of personal injury and wrongful death. This course was intended for juniors and senior undergraduate economics majors. All of the students in the course would have taken introductory micro and macro economic principles, and most would have had at least one additional course in intermediate economic theory, other courses in particular fields of economics (e.g., labor economics, public finance, international economics), courses in statistics and accounting and, perhaps, a course in econometrics, though this requirement is often postponed until very nearly the end of the student's undergraduate career.

At Penn State, there is a university-wide requirement that each student take at least one course in his or her major that qualifies as a "writing-intensive" course. The forensic economics course Rodgers taught was designated as such a course. The bulk of the grade for students in a writing-intensive course has to be determined by the quality of performance on essay examinations and other writing assignments. In this forensics course, students were required to take an essay mid-term and final examination. The mid-term examination was composed of a set of essay questions and/or computations that required a written explanation. The final examination was a take-home damages case, requiring a narrative report accompanied by spreadsheet tables. In addition to the examinations, there were four homework assignments interspersed during the semester that required written answers to questions and explanation of calculations for particular areas of damages. The grading of a student's work took into account both the correctness and quality of the content and the quality of writing, including style, grammar and punctuation. While about four-

fifths of the grading of any given assignment was based on content, the remainder was on the quality of the writing itself.

The Rodgers course also had its own computerized list service. Students enrolled in the course were automatically made subscribers to this list. If a student sent a message to the list, it automatically went to all other class students as well as the instructor. This proved a useful way for the instructor to distribute homework problems and answer keys. The list was also used as a vehicle both for distributing materials and for answering questions that were posed from time to time via email, and as a means of answering questions posed to Rodgers in class that he was not able to answer at that time. By this means, he could share a student's question and his answer with the entire class via the list service, and students who happen to have missed a class could still get handouts via email attachments.

It should be evident from the preceding course descriptions that a course in forensic economics fits in very well with the goals stated for courses fulfilling the "breadth" requirement described earlier. Such courses should forge close connections between both economic theory and empirical methods. Courses covering the breadth requirement often have an institutional base that is different than what students have previously studied. Yet they see the connection and value of economics in studying problems in these alternative institutional settings. The courses should also contain a substantial active learning component including such activities as oral and written reports, class discussions, and research. The forensic economics courses described here satisfy many of these requirements.

Also evident is the feasibility of teaching a course in forensic economics to either economics majors or a combination of economics and other majors. The goal of such a course would be the application of economic, financial and statistical knowledge at the senior level, a goal that comports nicely with the educational goal of having students apply and "do" economics. (Course outlines and related materials may be requested via email from Jim Rodgers as well as the co-authors.)

But what if it is not possible to teach an entire course in forensic economics? In the next section, we take up the application of forensic economics concepts and measurements in other economics courses.

IV. Use of Forensic Economics Concepts in Economics Courses

Perhaps the simplest method for incorporating forensic economics into the curriculum is to integrate useful aspects into existing courses. As noted earlier, research indicates that students are more apt to learn and retain economic knowledge when they are given the opportunity to apply economic concepts to problems. The field of forensic economics is ripe with problems to be addressed. Moreover, the real-world experience of a forensic economist when brought to bear on those problems within a classroom setting nearly always captures the interest and attention of students. The authors as well as other instructors have included such material in several courses, including principles of

economics, intermediate microeconomics, labor economics, and the graduate MBA curriculum.

There are, in fact, a significant number of economic concepts that can be demonstrated (or reiterated from earlier courses) within a forensic economic context. For example, the concept of human capital forms the basis of modeling loss in a personal injury or death case. The supply and demand market model easily applies to business-related damage cases or as a method of analyzing the market for the services of forensic economists. Marginal product of labor as a basis of labor demand can usefully explain how an injury can lower the market value of an individual. Even the use of indifference curves can be explored within a forensic economic context when discussing the value of fringe benefits as a tradeoff with wages or the tradeoff between the monetary and non-monetary value of a particular job. With some imagination, this list could be extended to other fundamental economic concepts such as opportunity costs, market structure, and economic efficiency.

A. Written Questions and Demonstrative Examples

Slesnick utilizes assigned questions as a primary method for linking forensic economics with other courses in economics. By doing so, the student understands how the economic methodology proposed can be utilized in a variety of ways. Besides the courses mentioned, forensic economics has a direct connection to other courses commonly taught at the undergraduate and graduate level, especially finance, law and economics, environmental economics and industrial organization. Forensic economists who teach in these areas may wish to write their own questions for use in the classroom. Over time, it may be possible to develop a number of ancillary materials that can be used by forensic economists whose primary occupation is teaching.

Another value of this type of exercise is to demonstrate how closely forensic economics depends upon traditional economic theory. Some practitioners in the field view the process of calculating economic damages as purely a computational exercise requiring minimal knowledge of economics. This is clearly not the case. Forensic economists who review these questions probably do not know all the answers. But the questions should make sense and the economist should be able to formulate answers with some minimal level of research.

A full list of topics and questions is available from Professor Slesnick. A short list of sample questions is provided in the Appendix.

Tinari has used forensic economics concepts in his Principles of Economics courses, primarily as demonstrative examples of particular topics. With respect to the topic of opportunity cost in his discussion of the homemaker-vs.-outside employment decision, not only are direct monetary tradeoffs considered (tax effects, job-related expenses, day-care costs, etc.), but also the valuation of household services is introduced. For the topic of economic growth, saving and investment, he uses the example of students acquiring additional human capital in the form of education, and then introduces lifetime earnings estimates of high school and college graduates as a tangible expression of the potential payoff of such investment.

In his discussion of labor markets, Tinari shows students the age-earnings profiles of males and females, and discusses differences in reported worklife expectancies. This is an ideal opportunity to also introduce principles students to the world of data sources. For his discussion of the role of profit in a capitalist economy, he emphasizes risk-taking and connects that to an explanation of why a relatively high discount is used by forensic economists in their calculations of future profits. Finally, Tinari's involvement in studying the September 11 Victims Compensation Fund has provided him several timely examples (valuation of services, growth rates, etc.) to use in his undergraduate courses. He notes how real-world examples grab students' attention which, in turn, reinforces the notion that forensic economics is fertile ground for classroom application.

B. Group Project

Besides the use of specific questions, Slesnick has assigned a major project to his graduate MBA class that is very similar to the final exam assigned in the forensic economics class. The class is divided up into groups. It is assumed that one member of the group is injured and cannot complete the MBA program. What they must do is examine the costs and benefits of an MBA program at Bellarmine relative to not entering the program. This requires calculating all costs, including the value of time, and the benefits in terms of incremental income earned over time. They must also calculate the internal rate of return of the investment. Some extensions are analyzed such as whether they believe there are non-monetary benefits from obtaining the degree. Like the undergraduate activity, each group must present the results in class and is critiqued by another group. Unlike undergraduate students, graduate students frequently put on slick Power Point presentations. One of the groups even staged a mock trial, complete with attorney, expert witness, judge and jury.

C. Forensic Economics Used in an Individual Project

Bellarmine University provides qualified students an opportunity to research and write a senior honors thesis. Slesnick has served as the advisor for several students who wrote honors theses in the area of forensic economics. One student was a member of Bellarmine's nationally-ranked Mock Trial team. Mock Trial is a national program that focuses on developing student skills in reasoning, argumentation, and communication. A national committee creates a fictional case complete with clients, a witness list, and evidence. Students act as attorneys and witnesses, and argue the case against opponents in front of attorneys who volunteer to serve as judges. The participants learn about judicial process and courtroom strategies while presenting and defending their case.

That year, the chosen case involved the death of an architect. The student's honors thesis included two activities. The first activity was thoroughly researching and writing an analysis of the hypothetical case. The thesis went well beyond what was required for her role as an expert witness. For example,

in addition to estimating lost income as required by the case, the student calculated lost household services. There was also an extended investigation of consumption issues and the proper net discount rate. The second activity was the student's role as an expert witness. Given her extensive knowledge of the case, she did exceedingly well in this role and played a key part in helping Bellarmine's team win the national championship.

D. Mock Trials and Moot Courts

Hersch and Viscusi (1998) used a mock trial format while at Duke University in a labor economics and a law and economics class. Two classes formed teams representing both sides of a case and were given two weeks to prepare arguments. The case involved the death of a young women based on an actual event. Students participated in a variety of ways, acting not only as lawyers and judges but the jury as well. In addition to the trial, a deposition phase prior to the trial was included. A variety of economic concepts were emphasized including calculation of present value, estimation of wage loss, decline of human capital value, the role of gender in influencing wages, estimation of self-consumption, and valuing household services. The authors felt that the format was an excellent vehicle for motivating students to "think like economists." Participants also enjoyed working directly with fellow students and presenting oral arguments in a realistic setting.

Carlson and Skaggs (2000) have written about a similar exercise, but one not directly tied to forensic economics. The authors used the moot court as an alternative to the typical lecture method. The most obvious application relates to the law and economics class where the primary players are the attorneys, judge and jury. However, any course where legal issues arise can use this technique. Thus, an instructor teaching environmental and natural resources economics, industrial organization or courses covering government regulation could utilize this approach. A legal controversy is submitted. Following the format of an actual trial, there are opening arguments, rebuttal and closing arguments. Written briefs submitted to the instructor help develop the student's technical writing skills while the trial itself is effective in improving facility at public speaking. Like the mock trial format used by Hersch and Viscusi, Carlson and Skaggs believe that moot courts are an excellent alternative to the typical "chalk and talk" methods. Students are asked to actually "do" economics.

E. Use of Forensic Economics by NAFE Members

In November 2001 a letter was sent to all participants on the NAFE-L list-serve, asking how they use forensic economics in the classroom. Several replies were received, and are summarized below.

Gary Wells, professor of finance at Idaho State University, has introduced forensic economics in a graduate seminar for MBA students and also in a financial modeling course for seniors. Professor Wells utilizes cases to introduce

the subject, with the objective to "introduce them to an area and stimulate their interest."

Mike Brookshire, professor of economics and industrial relations at Marshall College, introduces forensic economics in his Master's course covering labor economics. Other courses where the topic is utilized include human resource management, collective bargaining, and a capstone seminar course. In the human resources course, Professor Brookshire utilizes forensic economics as a real-world application of marginal productivity theory, human capital theory, wage differentials, age-earnings profiles, and household services. His extensive practice related to both discrimination cases and collective bargaining is a continuing source in the collective bargaining course and the capstone seminar. Professor Brookshire states that: "The value of my forensic experience is very significant from my perspective and, based upon course evaluations, from the perspective of my graduate students. It may be that the ability to relate this 'real-world' experience is even more important in teaching graduate and/or 'non-traditional' students."

James Zinser, professor of economics at Oberlin College, utilizes forensic economics in his principles of economics, law and economics and economic development classes. Professor Zinser applies forensic economics most extensively in the law and economics class. He takes students through calculations of economic loss in torts and losses related to business contracts. He goes through the use of obtaining information to calculate the present value of future economic loss and spends some time on profit-and-loss statements, given that few students have any accounting background. In addition, he raises questions about methods of calculating the value of life taken from the hedonics literature and several government documents. On a less formal basis, he discusses earnings projections and discounting in his economic development class. Topics where this applies are rate of return to education, the benefits and costs of environmental policies, and health care reform. According to Professor Zinser, "Without question, forensic economics has helped. Simply, I now teach law and economics because of my interest in forensic economics. Further, having been involved in a wide variety of cases, I have a wonderful set of examples to use in class. The 'war stories' make, I believe, for more interesting classes and the examples provide substance to the theoretical discussion."

David Schap, professor of economics at the College of the Holy Cross, uses forensic economics in his law and economics class. He discusses the value of human life literature when examining tort law. "I then digress into a somewhat detailed but brief (20 minutes) discussion of how forensic economists come up with the value of a specific human life for the purpose of compensation in cases of wrongful death." He also looks at how the value of life is calculated given an injury rather than death case. Professor Schap noted that the text he uses is Posner's *Economic Analysis of the Law.*

Steve Riley, economic consultant, was invited to give three lectures at universities in the UK concerning forensic economics. He was asked to lecture because each of the universities had well-established programs in Applied Economics or Law and Economics. They were interested in the "usefulness" of

economics as taught at colleges and universities. Dr. Riley related experiences acquired over an 18-year period in the field. "My personal observation is that students need to relate their studies in economics to something. They read something in the field and then they want to apply it. That's where I am. That's why I was successful in giving my lectures. Faculty and students in the UK are into this. Any course offered in forensic economics should include a strong foundation in student projects relating to their studies."

F. Forensic Accounting in the Classroom

The term "forensic" relates to legal proceedings. Forensic accounting is similar to forensic economics in that it refers to the use of accountants as experts rather than economists. Buckhoff and Schrader (2001) have reviewed the topic of teaching a course in forensic accounting to undergraduate students. What is of interest is that even though forensic accountants usually examine different types of cases than forensic economists, the motivation for establishing undergraduate courses in the two disciplines is quite similar.

Forensic accounting is primarily concerned with "detection, investigation, and prevention of both occupational fraud and financial statement fraud . . ." (Buckhoff and Schrader, p. 135) There is growing demand for accountants who possess this type of knowledge. Due to the widespread problem of fraud in our society, the Association of Certified Fraud Examiners was created in 1988.

Similar to the discipline of economics, there has been significant interest in determining what accounting graduates should know to successfully function in their future profession. According to Buckhoff and Schrader,

> Specifically, the firms concluded that accounting graduates were sorely lacking in three areas: (1) written and oral communication skills, (2) understanding the 'big picture' of how organizations work and the environment in which they operate, and (3) understanding the basic purposes and objectives of accounting and auditing. (p. 139)

In 1993, the American Assembly of Collegiate Schools of Business (AACSB) revised standards for accounting emphasizing (1) general education over special education, (2) written and oral communication skills, and (3) consideration of ethical and global issues.

The authors develop a rationale for teaching a course in forensic accounting that will not only help fill the need for better-trained accountants in the field of detecting fraud, but help achieve the overall goals of the accounting profession.

> First, due to the ever-increasing losses associated with fraud and the failure to detect it, both corporate America and public accounting should welcome accounting and business graduates who have knowledge and technical skills in fraud detection, investigation, and prevention. Second, forensic accounting encompasses a diverse combination of quantitative and qualitative skills which are consistent with the recommendations of both the AECC and AACSB. Quantitative

> skills include financial expertise, fraud knowledge, evidence collection, and knowledge of the legal system. Qualitative skills include report writing, testifying, interviewing, and consideration of ethical issues. Third, the investigative nature of forensic accounting forces students to see the "big picture" and ask questions such as, "Do the relationships among the various accounts on the financial statements make sense?" This type of critical thinking analysis is a skill in high demand by the AECC, AACSB, public accounting, and corporate America. (p. 141)

A course in forensic accounting, like forensic economics, can be very useful. The course not only helps achieve the professional need for better trained accountants, but develops skills that are valuable for a liberally educated individual. Thus, forensic accountants who teach courses in accounting may be able to use their consulting expertise in the classroom either as a stand-alone course in forensic accounting or incorporated into existing accounting courses such as auditing.

V. Summary and Conclusions

The experiences and knowledge of academics who practice forensic economics can serve the educational goals of their programs in very tangible ways. One way is to offer a full course in forensic economics within their academic department. Three examples of stand-alone forensic economics courses were described in this paper, with supporting material available from the authors. These should serve well those who wish to pursue this means of bringing their real-world application of economics in consulting to the classroom. The authors believe that this may be accomplished by forensic economists if they carefully consider both the mission of the institution and the particular goals of their department/school to see if an applied course would serve these ends. Moreover, interested faculty members should explore all possible avenues of delivering a forensic economics course within the programmatic and administrative strictures they face at their institution.

If a full, stand-alone course is not feasible, alternative ways of utilizing forensic economics in the curriculum are certainly available. Numerous examples of how forensic economic techniques and measurements may be utilized in a number of undergraduate and graduate courses were also presented. With modest effort, forensic economists who teach can use their expertise as an invaluable resource to facilitate the learning and use of economic concepts at the introductory and intermediate levels. This would greatly benefit students who would come to understand how "practical" many of the economic concepts they are learning can be.

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Appendix

Sample Questions

1. Assume that a forensic economist knows with certainty that the demand for his services is characterized by the following demand curve:

$$P = 2500 - 50Q$$

where Q is the number of cases per year. Further, the marginal cost for each case is $800. Fixed costs are $15,000 per year.

a) Draw the demand, marginal revenue, marginal cost, and average cost curve on a diagram. Determine the profit-maximizing price and quantity, as well as the corresponding level of profits. Show P, Q, and profits on your diagram.

b) In reality, firms (including forensic economists) do not know with certainty their demand. How do you think forensic economists search for the profit-maximizing price? What information do they seek out? (It should be apparent that the profit-maximizing price and quantity is part of an on-going search rather than values that can be determined with exact precision ahead of time.)

c) Suppose you asked a forensic economist how they determined price. Their response was that they found average cost per unit and then marked it up 200%. Is this cost-plus method of pricing necessarily at odds with the method employed in part a)? What do you think would have happened had the economist marked up the price by 200% and then found that he only had 10 cases a year? 200 cases a year?

d) One of the methods forensic economists might obtain market information is to ask other consultants what they charge for similar services. What if the National Association of Forensic Economics held a roundtable discussion where the main topic of conversation was fees charged clients? Would you say that such a discussion might be a restraint of trade intended to fix prices at a common level, or is it simply an exchange of information?

e) As a final point, the marginal cost was set at $800 per case and the fixed cost was $15,000 per year. What do you think the fixed costs might represent? The marginal costs? Where does the value of the expert's time fit in to all this? In fact, what do you think would happen to optimal price and quantity if the expert became Dean of the business school at the University where he is affiliated? Explain in terms of your diagram.

2. Assume that working as a carman for the railroad is more dangerous (in terms of accident rates) than other comparable jobs. Further assume that workers have perfect knowledge of what accident rates are for each occupation.

a) Explain why wages will tend to include a "risk premium" in the railroad industry. What factors will influence the size of this risk premium? (You should discuss both supply and demand factors.)

b) Now suppose that some railroad workers who were injured decide to sue the railroads for the income losses they have suffered. Under the assumptions of the question, do you think that it is unlikely that the courts will find the railroads liable–or even allow the case to come to trial?

c) If the courts nevertheless allow the cases to proceed and some of the injured workers do win sizable awards, what will tend to happen to the risk premium?

3. Almost all adults spend some time providing household services such as cooking, cleaning, shopping, etc. Suppose that a person is injured and can no longer perform such services. A lawsuit is brought to trial.

a) The defense attorney claims that household services can not be considered a loss because it is not a good or service sold on the open market and is not counted as part of GDP. As an economist, how would you respond?

b) Suppose that the defense attorney's motion to disallow a claim for lost household services is denied by the judge due to your brilliant arguments explained in part a). You are now faced with the difficult task of measuring these losses. Based upon the class discussion of cost as opportunity cost, how would you go about this using the concept of opportunity cost? Can you think of any other alternatives?

4. Assume that a person earns $10/hour and the optimal number of hours worked per day is 10.

a) Show this result on a labor-leisure diagram assuming a maximum 16-hour day.

Now assume that the person is injured. The effect of the injury is to reduce the wage rate to $6/hour but the person is still physically capable of working full time.

b) Show the impact of such a wage rate on the budget line. What will be the impact on hours worked? Break down the change into the income and substitution effects. Under what circumstances might the individual actually increase hours worked?

c) Now assume the injury does not reduce the wage rate (they retain their old job). However, in a 16-hour day he must devote four hours a day to preparing himself for work and to attend to his physical condition. Redraw the new budget line. Is this change an income or substitution effect? What will likely happen to the number of hours worked given the injury?

d) As a third possibility, assume that the individual receives the same wage rate and does not lose any hours attending to his disability. However, he must pay $15/day to someone who drives him to and from work. Redraw the new budget line and indicate the optimal number of hours of work. Under what circumstances might the individual completely drop out of the labor force?

e) Finally, assume that the disability does not change the wage rate and he is still physically able to work. No hours are lost to attending to his disability and there are no other out-of-pocket expenses that are illness related. However, working at the job is physically uncomfortable and the individual has a difficult time getting through the day. Redraw the indifference curves so that they now reflect this greater degree of difficulty at work. Are the curves steeper or flatter?

5. Go back to the previous question and assume that the impact of the injury lowers the wage rate from $10/hour to $6/hour.

a) Show the amount of money required to place the person back on his *original* indifference curve. This sum will provide sufficient funds to make the person as well off after the injury as prior to the injury.

b) What has happened to the number of hours worked compared to after the injury occurred but prior to granting the compensation award?

c) From a practical point of view, determining this amount would be difficult. A simpler approach would be to recognize that the wage rate fell $4/hour. If the person had previously worked a 10-hour day, the compensation could be set at $40/day. Show this result on your diagram. How does it compare to your answer in part b)?

As shown, these questions provide practical applications for the material used in the classroom. Questions for the principles and intermediate microeconomics classes can relate to almost any aspect of industry analysis such as supply, demand, market structure, incentives, institutional constraints, and government regulation. Questions for the labor economics class can relate to a variety of topics such as the labor-leisure model, human capital theory, and discrimination. In a macroeconomics class, one could create questions related to issues of employment and unemployment, as well as the relationship between interest rates, wage increases, and the rate of inflation. Such questions will not be found in any standard study guide or instructor's manual but must be developed by the instructor. However, questions like these help students to understand how the theory can be applied to real-life situations.