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Table of Contents
Southwestern Journal of Economic Abstracts
Volume 6, November 1, 1985

Author	Title	Page
W. Robert Brazelton	Editor's Comment.	1
Wendall Gordon	Invited Paper What to Teach in Undergraduate Economics	2
Ronald M. Ayres	A Quality of Life Indicator	7
Charles M. Becker and Terry E. Dielman	The Impact of Cash Flow on Electric Utilities Earnings Quality: A Texas Case	9
Donald L. Bumpass and Patricia J. Nichol	Justice Department Guidelines Toward Horizontal Mergers	11
Yoshi Fukasawa	Export-Orientated Growth?: A Study of Some Pacific Basin Problems	13
Marian V. Heacock and Patricia A. McDonald	Computer Crime: A Social Cost in the Managerial, Legal, and Ethical Environment	15
Jonathan Jones	Stocks, Returns, Money and Causality	17
Kia Siak Koong	Teaching Statistical Methods Using SPSS-X: Some Empirical Evidences for Mass Sections	18
Edward Nissan and Regina Caveny	A Comparison of Two Welfare Measures	20
Edward Nissan and D.C. Williams	An Impact Model for Development of Energy Sources	22
M. Ray Perryman	Empirical Determination of Technological Patterns in Advanced Regional Systems	24
M. Ray Perryman	Forecasting Models and Methods for the Texas Economy	26
Heydar Pourian	United States Interest Rates in the Eighties.	28
Mat Raven, Hamdi Bilici, and Carl Montano	Government Deficit and Utilities Bond Rates: An Empirical Exploration	30

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Kilman Shin	Estimating the Darby Effect, or the Effect of Tax Rate on the Nominal Interest Rate	32
Ben Uzoaru	Money Supply in an Open Economy	34
C. Howard Davis	Physician Diffusion--Some Places Get More Than Their Share	36

Comments

C. Howard Davis	The Labor Supply of Nurses: Some Comparisons by Julia Lane and LaVonne Booten	37
Marion Heacock	Mexico's Bank Nationalization and Border Banks: An Impact Survey, Jerry Prouck	38

Advertisements

Atlantic Economic Society	39
-------------------------------------	----

Submission Style

Style Format	40
Officers and Future Events	Inside Front Cover

Editor's Note
W. Robert Brazelton, Editor
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With this Volume, the Southwestern Journal of Economic Abstracts reaches a milestone. For the first time, the Journal includes the first of its annual 4-5 page "Invited Papers" series from distinguished scholars from the Southwest that are at or close to retirement--a sort of last statement or challenge from them to us. This year, we are honored by a contribution from a distinguished scholar--Wendall Gordon. Professor Gordon challenges us to teach what is relevant in the principles classes in economics, not what is obscure. With that sentiment, I am in deep and complete agreement!

In the coming years, we shall continue the process of having "Invited Papers" as a message and/or challenge to us. We will also continue to make more permanent the proceedings of the annual meetings of the Southwestern Economics Association, the first purpose of the Journal. I shall look forward to working with you on the present purposes of the Journal and its future growth.

WHAT TO TEACH IN UNDERGRADUATE ECONOMICS

The introductory economics course should be a course that deals with economic problems in an understandable down-to-earth manner. It should not be a course in which a fairly typical, reasonably intelligent student is alienated by an esoteric presentation of graphs and mathematics necessary as a preliminary for dealing with actual economic problems. There is no justifiable presumption that the student taking the introductory course will either be an economics major or become a graduate student in economics and a professional economist. But the course is now generally taught as though it was the preliminary conditioning exercise for someone looking forward to taking the graduate record examination in economics.

But, even if it is too much to ask that in the ascertainable future the gobbledegook be taken out of the elementary course, perhaps it is not too much to ask that departments of economics offer a reasonable, understandable, alternative course, which would be available to social science majors from history, political science, sociology, and so on, and to other non majors who have no special reason to be interested in the subtle and largely sterile niceties of mathematical and graphical price theory, general equilibrium analysis, and national income theory. They are not especially interested in learning to "think like an economist," if that means being able to check out mathematically the presumed behavior in a non-existent economy in which pure competition is presumed to exist.

Economists, thinking like economists, should have a conception of supply and demand that would enable them to appreciate the importance of offering a product that has some faint resemblance to what the clientele wants. But the attitude of departments of economics seems to be that, instead of giving the customers either what they want or what would be good for them, we have a captive audience and, by golly, we will rub their noses in first derivatives, second-order conditions, three-stage least squares, and $2 \times 2 \times 2$ assumptions. Economists should know that, in the setting of their assumption of pure competition, there is no such thing as a captive audience. But we are now talking about the "bottom line" and not about pure competition, and even economists have a sense that in the mixed economy that actually exists, they do have a captive audience thanks to the constraint that colleges of business administration are under to require that the business students be exposed to some economics.

Despite the behavior norms of this generation of academic economists, meaningful things can be said about the unbalanced budget, about the unbalanced balance of payments, about the relative merits of regulation and deregulation in different situations, about the relative merits of competition and competition, and about the break up of American Telephone and Telegraph. The course can be of real interest to intelligent students and involve meaningful discussion of meaningful issues. It is not necessary that the student have acquired a kit of price theory tools as a preliminary.

While we are thinking in these terms it should not be amiss to say something also about the total program involved in the undergraduate economics major. One is now talking about economics majors, but not necessarily about people who will become graduate students in economics or professional economists. Economics departments should understand that there is a whole world of decent, concerned people out there who are not going to colleges and universities because they are trade schools with a little more prestige than the Massey Business College. (Incidentally the Massey Business College may be doing a better job of what it is supposed to be doing than is the case with most departments of economics. I assume departments of economics should be interested in teaching a lot of meaningful economics to a lot of students.)

Departments of economics ought to be concerned to attract, as undergraduate majors, students with a liberal, social science type interest in their education. There do exist students who have not yet decided on what to make of their future lives, and who, at the college stage, are interested in acquiring understanding of nature, of society, and of the arts. Quite a few such people would even have an interest in an undergraduate economics major if they had reason to believe that the economics program was oriented to understanding the economy, rather than to qualifying professional economists. A lot of people, who will not become professional economists, have an interest in economics as a social or behavioral study. Let the chips fall later, where they may, as to whether these students will become professional economists, housewives,

salespeople, fighter pilots, engineers, politicians, or corporate executives.

Somewhat similar to the situation with the introductory course, if departments of economics insist on continuing to offer an undergraduate major program calculated to function as an apprenticeship for graduate work in economics, they ought to offer an alternative. They ought to offer an undergraduate major that does not require a repetition at the junior level of the price theory, national income theory, and general equilibrium analysis that they were exposed to in the introductory course. They should not be required to take mathematics for economists. And a reasonable assortment of courses in money and banking, public finance, international economics, labor, government-business relations, and business behavior should be offered that do not prejudge that the course material presupposes sophisticated mathematics and associated sophisticated analytical concepts. Meaningful things can be said in all these areas that do not require that the student already possess an assortment of concepts, of debatable validity, formulated in mathematical, graphical, or Boolean algebra terms.

The result of the content of the typical economics course is not that the non-economics major comes to understand some economics concepts, it is that such students learn no economics. And, an object of concern for those interested in marketing a product, it also means fewer economics majors.

So, this is a plea for the restructuring of the introductory economics course and the undergraduate economics major, or at least

a plea for offering a restructured introductory course and a restructured major program as an available alternative to those with a social science-behavioral science type interest in economics.

Economics is, or ought to be, an interesting and important and understandable subject.

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June 1985

A QUALITY OF LIFE INDICATOR

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The notion that income does not accurately measure individual well-being limits the usefulness of the traditional index of the quality of life, per capita income. That is, one must make a distinction between income and well-being. Because of this distinction it is not possible to conclude that an increase in income is either a necessary or sufficient condition for an improvement in the welfare of a population. Furthermore, even if one grants the usefulness of income as an index why should one focus on the central tendency to the exclusion of the other parameters of its distribution such as a measure of dispersion?

One of the more interesting measures of well-being is that proposed by the Overseas Development Council (ODC). This is the "physical quality of life index" (PQLI). This index grew out of the debate that arose during the 1960s over what constitutes a useful social indicator. Social indicators are statistics which are useful in making normative judgments about the state of some major aspect of an economy or society. As the literature of social indicators developed, it became clear that certain kinds of data are more appropriate social indicators than other kinds. Specifically, data that merely measures some input that produces social welfare is not a true social indicator. What is required are data that pertain to the level of welfare itself, not to the allocation of resources that presumably contributes to its production. Additionally, there is a consensus in the literature that manifestations of social phenomena are not unidimensional. Therefore, social indicators must necessarily be multidimensional in their scope.

In effect, we seek to develop social indicators whenever there is a gap in our knowledge that exists because the state of development of our theories is too rudimentary to permit understanding of the social phenomena we are studying. We also seek to develop social indicators whenever there is a gap in our data so that we cannot confidently measure the concept of direct interest.

The PQLI uses three variables in its construction. For a set of economies one takes figures for life expectancy, the literacy rate, and infant mortality. For each variable a value 100 is assigned to the best figure, and a value of 1 is assigned to the worst. Values that lie between the extremes are scaled to lie in the interval between 1 and 100. The final step in the calculation is to add together the scaled values for each of the three variables, then divide by three. Therefore, each observation for the PQLI will lie between 1 and 100, with greater values indicating a higher quality of life.

It is not possible to measure well-being in such a way that scholars would unanimously agree is correct. Those who employ the PQLI as a measure of welfare are aware of its imperfections. What may be claimed as the chief advantages to its calculation and use are its faithfulness to the criteria that separate more useful from less useful social indicators, and its economical data requirements.

In this research the method of principal components is employed in order to extract weights for the variables that make up the PQLI. Indexes are calculated for the states of the U.S. which are grouped together by Census Region for purposes of analysis. The results show a striking disparity in the quality of life enjoyed by the inhabitants of various regions in the U.S.

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THE IMPACT OF CASH FLOW ON ELECTRIC UTILITIES
EARNINGS QUALITY: A TEXAS CASE

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The central hypothesis of this paper is that a meaningful direct relationship exists between the cash flow of a given electric utility (CF_{Eu}) and that utility's earnings quality (EQ_{Eu}). Cash flow was assumed to be reported earnings plus depreciation (a non-cash expense). We used electric utility common stock prices (P_{Eu}) as a proxy for earnings quality.

Since cash flow, considered alone as a source of funds, could only constitute at best a partial explanation of electric utility common stock price changes, we felt it more appropriate to further adjust our central hypothesis so that it would reflect the uses of funds as well as the sources of funds. To do this we chose to substitute for cash flow a concept which we shall term net cash flow (cash flow divided by capital spending plus dividends). In this context it seemed reasonable to expect that as cash flow rose relative to capital spending plus dividends electric utility stock prices would also rise.

We decided to take into account the impact of long term financing on electric utility common stock prices. To do this two other equations were included in our study: $P_{Eu}=f$ (long term interest rates) and $P_{Eu}=f$ (electric utility book value). In both of these cases inverse relations were expected between the dependent and independent variables.

Our study, admittedly a pilot project, was confined to the following list of electric utilities: Central and South West Corporation (CSW), El Paso Electric Company (ELP), Gulf States Utilities Company (GSU), Houston Industries Incorporated (HII), Southwestern Public Service Company (SPS), TNP Enterprises Incorporated (TNP), and Texas Utilities Company (TCU). All of these electric utilities derive a considerable portion of their revenues from the state of Texas.

The data used in our study came from Value Line Investment Survey with the exception of our interest rate data which was taken from the Federal Reserve Bulletin. We chose to use the period 1958 to 1982 for analysis except that in two (El Paso Electric Company and TNP Enterprises) usable data just became available in 1968 and 1972 respectively.

ANALYSIS

To determine how Net Cash Flow, Book Value, and Interest Rates were related to electric utility stock prices the following linear regression was estimated for each of the utilities: $P_t = \beta_0 + \beta_1 BV_t + \beta_2 NCF_t + \beta_3 IR_t + \epsilon_t$ where P_t = stock price in year t , BV_t = book value in year t , NCF_t = net cash flow in year t , and, IR_t = long term interest rate in year t .

For each regression the Darbin-Watson test was used to test for first-order autocorrelation. When the test result indicated significant autocorrelation an interactive Prais-Winsten technique was used to re-estimate the equation.

Considering the Book Value variable, four of the seven coefficients are negative. However, only three are significantly different from zero at the 10% level.

For the Net Cash Flow variable, all seven coefficients are positive, but only one is significantly different from zero.

Four of the seven Interest Rate coefficients are negative but none of these four are significantly different from zero. Three coefficients are significant and positive, however.

One problem with the multiple regressions reported is a high degree of multicollinearity among the three explanatory variables. The presence of highly correlated explanatory variables results in an inflation of the coefficient standard errors and imprecision in the coefficient estimates. Multicollinearity can result in improper signs of coefficients as well as t -statistics which appear insignificant for important variables. Therefore, we also report estimates of the regression coefficients and t -values for three simple regressions: $P_t = \beta_0 + \beta_1 BV_t + \epsilon_t$; $P_t = \beta_0 + \beta_1 NCF_t + \epsilon_t$; and $P_t = \beta_0 + \beta_1 IR_t + \epsilon_t$.

In the simple regression of Price on Book Value, six of the coefficient values are negative, but only four are significant at the 10% level. For Net Cash Flow, all seven coefficients are positive, but only four are significant. For Interest Rate, all coefficients are negative but only three are significant.

JUSTICE DEPARTMENT GUIDELINES TOWARD HORIZONTAL MERGERS

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The purpose of merger guidelines is to provide clearer signals regarding merger activity the Antitrust Division would view as reducing competition or increasing market concentration beyond acceptable limits. The guidelines, first published in 1968, have been changed in response to changes in the economic climate of the United States, to difficulties faced by many "sunset industries" such as steel and automobiles, to account for the changing role of foreign producers, and to changes in economic analysis and evidence regarding the effects of mergers. The first of these changes came in a set of 1982 guidelines that embodied both a modification of enforcement policy and an increased reliance on economic analysis in the assessment of merger activity. The climate for merger activity became increasingly more favorable and, when the 1982 guidelines were unable to adequately address key issues in a number of proposed mergers (e.g. LTV-Republic, US Steel-National), a third set of guidelines were developed. The purpose of this paper is to examine the 1984 Guidelines with regard to horizontal mergers.

The newly revised Guidelines, announced and published on June 14, 1984, provide additional guidance and clarification to the 1982 Justice Department guidelines by doing three things. First, the 1984 revision states that the aim of merger policy is to take into account all relevant factors, not just a set of narrow tests based upon market share and concentration data alone. Second, they contain a revised view of foreign competition calling for application of the same market definition principles for foreign competitors that it applies to domestic firms. Foreign firms are to be included in the relevant market definition, if they import competing products, taking into account other factors such as trade restraints and the presence of excess capacity among the foreign firms.

Finally, the revisions expand the analysis of potential efficiencies that result from a particular merger. While the 1982 Merger Guidelines did not regard efficiency gains as generally relevant to decisions on opposing (or not opposing) a merger, the 1984 Guidelines address the efficiency issue directly:

The primary benefit of mergers to the economy is their efficiency-enhancing potential, which can increase the competitiveness of firms and result in lower prices to consumers...[t]he

Guidelines will allow firms to achieve available efficiencies through mergers without the interference from the Department [1, pp. 35-36].

Thus, the 1984 version provides explicit recognition of the potential for mergers to be socially beneficial through their efficiency effects such as economies of scale, better integration of production facilities, plant specialization, and lower transportation costs.

The paper extends a model first developed by Williamson which enables an evaluation of the costs and benefits of a proposed horizontal merger [2]. The analysis emphasizes that merger activity can effect economic welfare by altering both market power and economic efficiency. To compare the market power and efficiency forces, we examine the merger's impact on consumer surplus which is the vehicle often used to measure consumer welfare. The economic efficiency gains represent the value of the other goods produced when resources are released from the industry under study to the rest of the economy. The value of those other goods produced must be offset against the net economic effect of the merger.

One important conclusion from this model is that modest efficiency gains offset rather sizable price increases. This leads to a conclusion which more strongly supports Williamson's view that a merger which yields non-trivial real economies must produce substantial market power and result in relatively large price increases for the net allocative effects to be negative [2].

The recent changes in Guidelines have been viewed by some as being too "pro-business" since they allow a larger number of horizontal mergers to go unchallenged by the Justice Department. The economic analysis concerning economic efficiencies is one of the positive aspects of the 1984 revisions since it permits both costs and benefits of merger activity to be considered. One significant unanswered question, however, is whether enforcement policy will be consistent with the guidelines. As economic and political conditions in the US (and in the world) change, reevaluation and revision of the guidelines is both expected and necessary.

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Export-Oriented Growth?: A Study of Some Pacific Basin Economies

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This paper examined the role of exports in the economic growth of some selected Pacific Basin countries in the post war period. Of particular interest was the measurement of the magnitude of the importance of the effect of export expansion to economic growth of a country.

Model:

Economic growth of a country is affected by many factors including capital accumulation, labor force growth, technological advance, export expansion, and others. Consider equation (1) of the following form which will be used as an estimating model for economic growth in this study:

$$Y(i) = a + a_1K(i) + a_2E(i) + a_3X(i) + e \quad (1)$$

where $Y(i)$ = economic growth, measured in GDP in country i ; $K(i)$ = capital formation in country i ; $E(i)$ = employment expansion in country i ; and $X(i)$ = exports of country i . All the variables are in natural logarithm. The expected signs of the coefficients are $a_1 > 0$, $a_2 > 0$, and $a_3 > 0$.

Economic growth of a country may not respond immediately to changes in capital formation, labor force growth, and export expansion. It is suggested that some amount of time will lapse before growth in capital, labor, and exports produces a resultant impact on the economic growth of a country. To estimate such an impact-time lag, consider the following Koyck-type distributed lag model:¹

$$Y(i,t) = b + b_1I(i,t) + b_2E(i,t) + b_3X(i,t) + b_4Y(i,t-1) + b_5Y(i,t-2) + \epsilon \quad (2)$$

where $Y(i,t-1)$ and $Y(i,t-2)$ represent economic growth (GDP) at $t-1$ and $t-2$, respectively. All the other variables were defined earlier.

The average lag of the peak impact can be calculated by the use of the coefficient estimates of the lagged dependent variables, $Y(i,t-1)$ and $Y(i,t-2)$. The lag measures the average amount of time having lapsed before the growth rate receives the peak impact of the change in capital formation, labor force, and exports. The shorter the average lag, more important is the relationship between economic growth and such underlying economic factors of a given country.

Results:

The results of estimating equation (1) with the use of an ordinary-least-squares method are presented in table 1. Annual data are used in the study. All the data were collected from IMF International Financial Statistics.

Statistics.

The explanatory power of the model in the form of equation (1) is reasonable, R^2 ranging from 0.988 to 0.999, as shown in table 1. The model is, however, plagued by the presence of serial correlation, as indicated by the Durbin-Watson (D.W.) statistics.

The coefficient estimates of capital formation, a_1 , show the expected sign for all the countries except Malaysia and Singapore. Furthermore, the

Table 1
Regression Results : Equation (1)

Country	Year	Constant	InI	InE	InX	R	S. E.	D. W.
Australia	1951-82	0.942	0.709* (0.073)	0.243 (0.255)	0.279* (0.043)	0.999	0.036	0.469
Canada	1951-83	2.726	0.558* (0.067)	-0.247 (0.145)	0.405* (0.059)	0.998	0.041	0.520
Indonesia	1964-82	18.944	0.602* (0.173)	-3.556 (1.826)	0.422* (0.157)	0.992	0.226	1.211
Japan	1954-82	2.762	0.699* (0.094)	-0.226 (0.101)	0.302 (0.175)	0.999	0.041	1.102
Korea	1955-83	14.022	0.694* (0.101)	0.338 (0.129)	0.362* (0.127)	0.997	0.114	0.884
Malaysia	1957-82	0.677	-0.330* (0.112)	0.312 (0.305)	0.463* (0.116)	0.986	0.095	0.989
New Zealand	1952-82	1.502	0.339* (0.079)	0.947 (0.186)	0.521* (0.058)	0.998	0.042	1.226
Philippines	1955-80	0.257	0.488* (0.109)	0.475 (0.484)	0.259* (0.059)	0.996	0.063	0.513
Singapore	1962-83	3.810	-0.148 (0.160)	-0.908 (1.614)	0.884* (0.163)	0.988	0.097	0.686
Thailand	1955-82	1.923	0.269 (0.139)	0.044 (0.409)	0.597* (0.083)	0.995	0.067	2.265
U. S.	1955-83	1.339	0.659* (0.138)	0.387 (0.286)	0.144 (0.076)	0.994	0.048	0.669

Note: * statistically significant at 0.05 level

estimates are statistically significant at 0.05 level for most countries. Capital formation is an important factor contributing to economic growth of these Pacific Basin countries.

The coefficient estimates for labor force growth, a_2 , appear, however, insignificant in all the countries reported in the study. In some countries, the estimates show a negative sign.

The estimated coefficients of exports, a_3 , exhibit the expected sign for all the countries and are statistically significant at 0.05 level, except for Japan and the U.S. Thus, the results imply that the economic growth of all the countries in the Pacific Basin except the U.S. and Japan has been significantly affected by export expansion in the post-war period.

Average lags are calculated with the use of the coefficient estimates of equation (2). The estimated lag periods in years are 0.97 for Australia, 1.53 for Canada, 0.25 for Indonesia, 1.45 for Japan, 0.71 for Korea, 1.77 for Malaysia, 0.88 for New Zealand, 3.17 for the Philippines, 3.18 for Singapore, 1.84 for Thailand and 3.70 for the U. S.

Notes:

¹ Hodgson and Phelps used a similar model to examine the distributed impact of price level change on exchange rates. See John S. Hodgson and Patricia Phelps, "The Distributed Impact of Price-Level Variation on Floating Exchange Rates," The Review of Economics and Statistics, (February 1975), pp. 58-64.

COMPUTER CRIME: A SOCIAL COST IN THE MANAGERIAL, LEGAL, AND ETHICAL ENVIRONMENT

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One of the most pressing social issues today has been created by the technical and economical feasibility of storing large volumes of data regarding private citizens. Computer systems make this data readily accessible and available for rapid analysis. Improperly used, these data banks offer a potential for misuse and abuse, both of which can culminate in computer crime.

In the Managerial Environment, the basic methods employed in the commission of a computer crime are: (1) sabotage: the physical destruction of a computer and/or storage media; (2) data diddling: changing data before or during their input, or at the point of output; (3) superzapping: the unauthorized use of utility computer programs in order to modify, destroy, copy, disclose, insert, use or deny use of data stored; (4) scavenging, both physical and electronic: used to obtain residual information in the area of a computer system; and (5) physical removal of data: which involves any covert means of obtaining data from a computer system.

In the Legal Environment, no statutory definition of a computer crime exists. The definition in this paper is 'any illegal act for which knowledge of computer technology is essential for its perpetration, investigation, or prosecution,' used by the U.S. Department of Justice for research purposes.

Prosecutors, attorneys and law enforcement agencies have offered educative training seminars. However, the judicial system has not recognized the need for applied knowledge among the judges who adjudicate these cases. Forty federal statutes indirectly address the problem, with seventeen states having direct statutory controls.

In the Ethical Environment, the issue of social costs becomes apparent. Rights to Personal Privacy, protected at the Federal level by the Fair Credit Reporting Act of 1970 and the Privacy Act of 1974, are not sufficiently protected in the field of computer technology. Nine States have enacted fair information practices legislation, designed toward individual protection from data processing system abuse.

The developing Electronic Funds Transfer System, designed to create a cashless society, possesses the potential of becoming one of the largest communications networks in existence. Authorities voice the opinion that EFTS is an alarming threat to freedom, as this system could gather all financial and statistical data relative to an individual.

Data Confidentiality, which requires that all company data be protected from misuse, and Data Security, which provides the mechanisms to protect data, both are direct responsibilities of management.

Disputed rights to products, involving the proprietariness of program products, have become significant ethical issues. In order to avoid proprietary disputes, two methods of avoidance are: (1) to place the responsibility for preserving proprietary rights upon the individual taking action with the program; and (2) to assume that a program is in the public domain unless it is explicitly identified as being proprietary.

In many areas of life where public safety and welfare are a consideration, society has seen fit to authorize governmental agencies to license personnel prior to allowing them to practice their profession. The same form of control has been suggested and debated within the computer industry. Issues in this domain which deserve consideration are: (1) should programmers and systems analysts be required to pass a rigid examination and be licensed before allowing to practice; or (2) should programmers be required to carry malpractice insurance and be held legally liable for errors in their programs which might adversely affect public safety and welfare.

Elements of society contend that computer technology is a serious threat to personal freedom and privacy, resulting in harmful social costs. Others argue that the social benefits far outweigh the possible dangers to individual rights and freedoms, which can be protected by proper legal safeguards. As the total social order will demand that computer power be directed toward beneficial purposes, the issue of social costs vs. social benefits should be approached by the data processing industry as a challenge to be met by the free enterprise system. Due to the severity of the issue, the only alternative will be government regulation of a relatively unregulated industry.

STOCK RETURNS, MONEY, AND CAUSALITY
(Empirical Evidence for the U.S., 1974-1983)

Jonathan D. Jones

The Catholic University of America

This paper uses the Granger causality test to assess the causal nature of the pairwise relationships between two stock price indices and three monetary policy aggregates for the U.S. during the period May-1974 to December-1983. In addition, tests of the non-predictive monetary portfolio model proposed by Rozeff (1974) are undertaken. The two stock price indices include the New York Stock Exchange and the Dow Jones Industrial Average Composite indices, and the three monetary aggregates include M1, M2, and MB (monetary base). The results of the tests reveal no evidence of causality from the money measures to the stock price indices and support the nonpredictive monetary portfolio model. The results can also be interpreted as lending support to the efficient market hypothesis since lagged values of the monetary aggregates have no explanatory power for either of the two stock prices.

TEACHING STATISTICAL METHODS USING SPSS-X:
SOME EMPIRICAL EVIDENCES FOR MASS SECTIONS

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The basic idea and purpose of using computer statistical packages in introductory business statistics courses is to expose college students to the remarkable advances in computer technology and its application to solving business problems. Generally, students in introductory business statistics courses are taught to use computer statistical packages by including the data in a source program or by having a source program which accesses an external data file. This study examines the use of these two conventional approaches and attempts to identify which of these two approaches is better suited for teaching mass sections of introductory business statistics courses.

An experiment was conducted on a group of students who had no prior experience with both the computer system and any form of computer statistical packages. After receiving an introductory lecture on the computer system and the SPSS-X package, the students were given an assignment. A systematic random sampling technique was used to divide the students into two groups. One group included the data in the source program. The other group used the program to access the data from an external data file.

Multivariate analysis of the data indicated statistically significant differences between the two groups. Inspection of the treatment means showed that the group that included the data in a source program completed the assignment with significantly less coding and manual errors, number of computer runs, and time than those that accessed the data from an external file. It also appeared that the distribution of the data is not symmetrical and exhibited relatively high peakedness.

The results of this study should be of interest to faculty members who are teaching introductory business statistics courses and authors of forthcoming introductory business statistics textbooks which incorporate some form of computer statistical packages. Many textbooks require students to access a database in

the running of their assignments. This approach is not appropriate for introductory business statistics mass sections. Apparently, first time users of some form of computer statistical packages have tremendous difficulty relating the program coding to the data if the data is not visible. Longer time spent on the terminals, more coding and manual errors, and larger number of computer runs will increase the already limited budgetary and instructional staffing requirement existing in most business statistics and information systems department.

Introductory business statistics classes, especially mass sections with first time users of some form of computer statistical packages, should use short computer statistical programs with the data included in the source program. The use of computer statistical programs to access databases should be used only in intermediate statistics courses or the second statistics course. Once the student has gained sufficient exposure to the computer statistical package in use, the transition from using small sets of data to large sets of data stored in databases for business statistics assignments will be greatly eased.

A COMPARISON OF TWO WELFARE MEASURES

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University of Southern Mississippi

This study intends to assess and compare the quality of life for nations of the Organization of American States in two ways. The first is in terms of the conventional approach which uses per capita GNP. The other, is by means of development of a welfare measure in natural units of goods and services.

The data are for the year 1978 and were obtained from the World Bank. Since the component variables were expressed in a very different and incomparable units of measure, the data were normalized before calculations were performed. The multi-dimensional measure called the taxonomic distance is then computed as:

$$[\sum (C_j - U_j)^2]^{\frac{1}{2}}$$

where c is a country other than the USA; U is the USA; C_j is the standardized score of variable j for country c and U_j is the standardized score of variable j for the USA.

Eighteen variables ($j=18$) were selected as follows:

- Adult literacy rate (percent)
- Life expectancy at birth (years)
- Average index of food production per capita
- Average annual growth of population (percent)
- Crude birth rate per 1000 population
- Crude death rate per 1000 population
- Total fertility rate
- Percentage of population of working age (15-64 years)
- Percentage of labor force in agriculture
- Percentage of labor force in industry
- Percentage of labor force in services
- Average growth of labor force (percent)
- Urban population as percentage of total population
- Child death rate (ages 1-4)
- Population per physician
- Population per nursing person

Daily calorie supply per capita
 Number enrolled in primary schools as percentage of age group.

The results are presented in the Table. The first column is a listing of per capita GNP in U.S. dollars for 1978 and the second column provides its ranking. The third column contains the computed unitary measure of welfare with the U.S. taken as the base country. Column (4) gives ranks of the various countries in terms of their distance measures, thus providing a means of comparing a nation according to a ranking of "quality of life" with a ranking according to per capita GNP. Differences in these two ranks are provided in the fifth column.

	GNP Per Capita		Multi-Dimensional Measure		Difference In Ranks (GNP-DIST)
	Dollars	Rank	Distance	Rank	
1 ARGENTINA	1910.	4	2.382	2	2
2 BOLIVIA	510.	21	10.033	21	0
3 BRAZIL	1570.	6	6.455	11	-5
4 CHILE	1410.	8	4.445	5	3
5 COLOMBIA	850.	16	5.777	8	8
6 COSTA RICA	1540.	7	5.411	7	0
7 CUBA	810.	18	4.236	4	14
8 DOMINICAN REP.	910.	13	8.691	18	-5
9 ECUADOR	880.	14	8.406	16	-2
10 EL SALVADOR	660.	20	8.493	17	3
11 GUATEMALA	910.	12	9.155	20	-8
12 HAITI	260.	23	12.399	23	0
13 HONDURAS	480.	22	10.761	22	0
14 JAMAICA	1110.	11	5.925	9	2
15 MEXICO	1290.	10	7.318	13	-3
16 NICARAGUA	840.	17	8.993	19	-2
17 PANAMA	1290.	9	6.086	10	-1
18 PARAGUAY	850.	15	7.725	14	1
19 PERU	740.	19	8.058	15	4
20 TRINIDAD & TOBAGO	2910.	3	4.946	6	-3
21 URUGUAY	1610.	5	2.981	3	2
22 VENEZUELA	2910.	2	6.595	12	-10
23 UNITED STATES	9590.	1	.000	1	0

An analysis of the two rankings is undertaken by means of Spearman's Rank correlation, r_s . The computation yields a value of $r_s = -.735$, which is significant at the 5 percent level. This presents a proof that, in general, income has a direct relationship with many elements indispensable for welfare.

AN IMPACT MODEL FOR DEVELOPMENT OF ENERGY SOURCES

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With the increased investment in the production of energy, long term effects on the economy of a region as well as environmental degradation will result. Hence, environmental protection must be invoked as an integral and important aspect of the analysis of the economic impact.

This study attempts to provide a brief outline of a regional impact model utilizing input-output techniques. The approach is comprehensive since the introduction of energy facilities in a region might be evaluated in terms of economic as well as environmental impacts. A mathematical exposition is presented.

An input-output model describes the economic activities of a region in an accounting framework. In compact matrix algebra form, it may be written as:

$$\begin{aligned} X - AX &= D, \\ X &= (I - A)^{-1} D. \end{aligned} \quad (1)$$

Here, X is a vector representing gross outputs of the economic sectors, D is a vector of final demand, and $(I - A)^{-1}$ is the Leontief Inverse. Each entry in this matrix represents the direct and indirect requirements. Useful measures called Type I and Type II output, income and employment multipliers can be calculated by well-known mathematical manipulations.

The connection of the economic section with the environmental section can be accomplished by letting:

$$R = \begin{bmatrix} R_1 \\ R_2 \\ \vdots \\ R_n \end{bmatrix} \quad B = \begin{bmatrix} b_{11} & b_{12} & \cdots & b_{1n} \\ b_{21} & b_{22} & \cdots & b_{2n} \\ & & \ddots & \\ b_{n1} & b_{n2} & \cdots & b_{nn} \end{bmatrix} \quad X = \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_n \end{bmatrix}$$

where R = a vector of n environmental resources; B = a matrix of mn elements where each b_{ij} corresponds to use of environmental

resource i per dollar output in sector j , and X = a vector representing dollar outputs of each sector j , then $R = BX$ is a vector corresponding to total requirements of environmental resources.

On substituting the values of X from equation (1) for their corresponding values in $R = BX$ the result is

$$R = B (I-A)^{-1}D.$$

In this manner, the values of R represent the direct and indirect requirements of environmental output as a result of supplying economic goods to final demand. Environmental Type I and Type II multipliers can then be calculated.

To evaluate the impact of a construction phase on each producing sector, the values may be obtained by the relation:

$$\Delta X = (I-A)^{-1}\Delta D$$

where ΔX = incremental production required by each sector to support the construction phase and ΔD = incremental change in final demand. The appropriate multipliers can then be calculated.

For an operation phase, the procedure involves a reconstruction of the direct input requirements in the input-output model to take care of the added demands. If new plant is to generate further electric energy, the linkage with the environmental matrix and the estimation of multipliers can then be deduced in a similar manner as explained earlier. The changes in performance in the economic-ecologic activities in the region before and after construction will be apparent.

EMPIRICAL DETERMINATION OF TECHNOLOGICAL PATTERNS
IN ADVANCED REGIONAL SYSTEMS

M. Ray Perryman

Baylor University

Texas is an "oil" state. Virtually the entire twentieth century economic history of the region can be accurately interpreted in light of energy developments throughout the world. Spindletop marked the beginning of the oil era in the state when it (literally) burst onto the scene in 1901. Oil was certainly the key to the roaring Texas economy of the 1970s, as the Arab oil embargo and general excess demand conditions combined to bring dramatic increases in the price of petroleum and related products. In recent years, however, world-wide recessions, fuel-efficient technology, and a more conservation-conscious public have dampened the demand for petroleum products, while problems in many producing countries have led to uncharacteristically high levels of production. These forces have, of course, combined over the past three years to produce a "glut" in the international oil market. This situation, in turn, led Texas into its first significant business downturn in more than two decades. Although this contraction was accurately predicted by the Texas Econometric Model which is maintained under the direction of the author at Baylor University Forecasting Service, its emergence stunned many Texans and sent shock waves throughout the public and private sectors. The true extent to which state business activity was dependent upon extraction, refining, petrochemicals, oilfield equipment production, oilfield servicing, petroleum engineering, and revenue from severance taxes became known to a large segment of the citizenry for the first time.

For much of its 150-year history as a republic and a state, Texas was dependent upon agrarian industries for its economic well-being. Both cattle and cotton enjoyed periods of dominance. As the industrial revolution came in full force to the northeastern part of the country, Texas was able to sustain its prosperity through oil and gas extraction. As the agricultural sector declined in relative importance, the mineral sector expanded. The recent world oil glut, of course, makes it apparent that still further diversification is needed if Texas is to remain among the nation's more

prosperous regions. The traditional dependence on agriculture and minerals has endowed Texas with a "frontier spirit" of meeting challenges as they arise. At the present time, that spirit is compelled to find a "new frontier" in which to reside. The most obvious venue for industrial expansion is, of course, the technological enterprises which are commonly labeled "high tech." This rapid growth industry enjoys high visibility throughout the world and is highly regarded as the economic mecca of the 1980s and 1990s. Although interest in technological enterprises within Texas may be traced for decades into the past, the world petroleum market situation has brought a sense of urgency regarding their recruitment and development. An additional major catalyst to this interest was, of course, the decision by Microelectronics and Computer Technology Corporation (MCC) to locate in the Austin metropolitan area. Communities throughout the state, particularly along the "I-35 corridor," are now actively engaged in efforts to attract various types of technological enterprises.

What is the potential for the development of technology industries within the state of Texas? The analysis described herein formally examines this question in great detail. Initially, an appropriate set of definitions for the "high tech" industries is provided. This preliminary explanation is followed by a brief contextual statement regarding the present international and domestic industrial environment for technological innovation. Highly detailed production and employment forecasts for the technology industries within the state are then provided. This examination will be given on both a short-range and a long-range basis. Finally, a concluding section will provide an overall perspective on the issues which are relevant to state economic activity.

FORECASTING MODELS AND METHODS FOR THE TEXAS ECONOMY

M. Ray Perryman

Baylor University

The presentation described herein represents a synopsis of recent development in the Texas Econometric Model and the Houston Metropolitan Area Econometric Model. Both of these models, as well as numerous others, were developed and are maintained under my direction at Baylor University Forecasting Service. In addition to a summary of the structure and performance of these models, some recent economic outlook information was also provided. The Texas Econometric Model is a large scale simultaneous equation model that is capable of generating highly detailed projections under alternative sets of economic conditions. It is fully linked to and integrated with the national and international models of Wharton Econometric Forecasting Associates. Consequently, the simulations can account for events in Mexico, Latin America, and the Middle East which have dramatic effects on the Texas economy. The system has both long-term and short-term versions, and encompasses a large number of sectoral and geographical submodels. It contains substantial industrial detail and exhibits a flexible structure which can be modified in response to specific requirements. The Texas model has excellent linkage capabilities and, thus, can be integrated into modeling systems for public utilities, banks, government agencies, etc. The Houston short-term model, which is one of more than a dozen metropolitan area models that are maintained at Baylor University Forecasting Service, is fully integrated with the Texas model and provides the maximum level of detail permitted by current data base constraints. Consequently, it can also be simulated under widely varying national and international conditions. All of the models include projections for gross area product, a series generated from a city/county software which was created by Baylor University Forecasting Service.

In terms of the forecast described in the presentation, emphasis was placed on (1) a baseline set of projections, (2) alternatives based on varying assumptions regarding the value of the dollar and inflationary expectations, and (3) alternative oil price scenarios. Without exception, the results emphasized

the fragile nature of the state and area economies and their sensitivity to national and international events. Extensive discussion regarding various industrial components was also provided. In summary, the presentation sought to offer a brief, but relatively complete, discussion of the major elements of the modeling structure maintained at Baylor University Forecasting Service and to synopsize current projections regarding state and area business activity. The results were also compared with other forecasts which were proffered at the meeting.

UNITED STATES INTEREST RATES IN THE EIGHTIES

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Western Carolina University

Why were the level of U.S. interest rates so high during the early 1980s and so low during the 1933-37 period? Why were the yield curves oft-positively-sloped from the 1930s to 1979, but negatively-sloped before the 1930s and during the 1980-81 period? (Cf., e.g., Cagan [1966] and Wood [1983].) The first part of this paper summarizes the arguments put forth by Pourian's [1983a] and [1983b].

The answer partly lies in the regulatory environment. In 1933, the famous Banking Act placed caps on bank deposit interest rates, which eventually pulled down market rates of interest, while in 1980, the Depository Institutions Deregulation Act removed those caps, which pushed up the market rates. The yield curves may have been also affected, since bank deposits are closer substitutes for short-term market securities.

The suggested mechanism is a demand-side, Marshallian market force. There is a natural yield curve in an unregulated regime and, therefore, equilibrium interest rates on both bank deposits (as assets) and market securities. When the regulatory/policy authority imposes Regulation Q on bank deposits, there will be a portfolio shift from bank deposits to securities that will result in a new (constrained) equilibrium. This tends to depress both short-term and long-term rates relative to the unconstrained regime. Thus, market rates would have a tendency to fall after the imposition of bank deposit regulation, as in 1933-37 period.

The resultant portfolio shift and flow of funds, however, would not influence short- and long-term rates uniformly. The short-term rates fall more because short-term securities are closer substitutes for bank deposits than are long-term bonds. The net effect is, therefore, to depress the low end of the yield spread more than the high end and to transform a normally falling yield curve into a rising one.

Conversely, when Regulation Q is (gradually) removed, as in 1980, not only the whole term structure is pushed up (exhibiting high rates across the board), but the yield curve could also resume its unregulated, falling shape.

From a modeling point of view consider an economy with three

financial instruments: a bank instrument DD, a short-term money-market instrument CP, and a long-term capital-market instrument CB. All instruments are assumed to be gross substitutes. Naturally, however, CP is a closer substitute for DD than CB is for DD.

REGULATION (1930s): When the authority regulates DD by setting its interest to zero, disintermediation occurs. Since CP is a closer substitute for DD, however, the resultant disintermediation would direct more funds to the money market. The short-term rate, therefore, would have a tendency to fall relative to the long-term rate. The yield curve apparently exhibits a positive slope.

DEREGULATION (1980s): In a deregulatory environment, in contrast, there would be a tendency for the short-term rate to rise above the long-term rate, since the resultant increased intermediation would likely occur more at the expense of the short-term, CP market. Apparently, the yield curve may become "inverted" after the abolition of a regulated bank rate regime.

In accordance with the theme of the conference, in the second part of the paper an attempt is made to simulate and forecast two types of interest rate (a commercial-paper rate and a corporate-bond rate) through two kinds of experiment (a post-war experiment and a pre-great-depression experiment).

It is argued that while levels of various interest rates is expected to be higher in the eighties, their movements will probably continue to imitate their past history. A method is proposed and used for simulations which averages the business-cycle fluctuations of interest rates. This method is referred to here as a "cyclical indexing analogy" method. One simulation/forecast shows that the corporate bond rate will peak at 13.75% in January, 1986, before falling to 11.75% in November, 1986.

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GOVERNMENT DEFICIT AND UTILITIES BOND RATES:
AN EMPIRICAL EXPLORATION

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The run-up of federal budget deficit to unprecedented levels in recent years has alarmed businessmen, politicians and ordinary citizens alike. Repeatedly, it has been stressed to the public that as government borrowings to finance the deficit continue to clash with the credit demands of the private sector, especially in the course of the recovery, there will be strong pressures in the credit markets for the interest rates to rise. And as this persistently large deficit occurs when the economy is approaching full utilization of resources, just over the horizon lurks the possibility of a new round of inflation. If the monetary authorities curtail credit expansion to prevent the resurgence of inflation, the economy could be in for a further rise in interest rate, crowding out of capital spending, and sharp slowdown in expansion, or at worst, a recession. To prevent future damage to the economy, many policymakers agree that steps must be taken soon to reduce the deficit to manageable levels.

The utilities industry is particularly vulnerable to the rising interest rates and the possible crowding out because of the industry's heavy reliance on debt for business operations. To this industry, the unraveling of the relationship between government deficit and utilities bond rates -- particularly the linkage of their amounts and timing -- is strategically important.

This paper first surveys the competing views on the connection between interest rates and federal budget deficits. An eclectic analytical framework is presented which subscribes to the conventional view that government deficits influence interest rates, yet at the same time recognizes that there are compounding variables in the macroeconomic linkage between government borrowing and interest-rate rise in the bonds market.

The rest of the paper presents the findings of the exploratory regression analysis of the link between government borrowing and interest rate in the utilities bond market. Instead of using a full-blown IS-LM model showing the transmission mechanism from government borrowing to the rise of utilities bond rates, the study explores into the time lags involved in this transmission process. The main objective was to determine how well federal budget deficit serves as a leading, coincident, or lagging indicator of utilities bond rates.

Federal budget deficit and utilities bond rates were regressed using a simple linear regression model. The dependent variable was operationalized as the monthly average interest rate on newly-issued, A-rated public utility bonds, as determined by Moody's Investor Service, in percent. The independent variable was defined as the monthly 12-month rolling, unadjusted net surplus or deficit ("current deficit"), in billion dollars. The data consisted of 286 monthly observations from January 1960 through October 1983. Various time "lags" and "leads" on government deficit of up to 24 months were experimented to analyze the nature of the lags or leads in the transmission process. The coefficient of determination (R^2) served as the indicator of the extent to which variation in utilities bond rates is explained by government deficit.

The main finding of the study is that the actual federal budget deficit surprisingly serves better as a lagging indicator of utilities bond rates, rather than as a leading indicator. This result implies that the utilities bond market (through expectations) integrates advanced information on federal budget deficit contained in federal budget reports (either by the White House or the Congressional Budget Office) into the interest rate structure long before the actual government borrowing to finance the deficit occurs.

ESTIMATING THE DARBY EFFECT, OR THE EFFECT OF TAX RATE ON THE NOMINAL INTEREST RATE

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The effect of tax rate on interest rate is often called the Darby effect (1975). The question is how to measure it. In a recent article, Ayanian (1983)¹ uses the following method to measure the tax effect on interest rate: In equilibrium, the tax free interest rate should be equal to the after tax taxable interest rate. That is:

$$i_1(1-t) = i_2 \quad (1)$$

Thus

$$i_1 = (1/(1-t)) i_2 \quad (2)$$

where i_1 = taxable interest rate, i_2 = tax free interest rate, $1/(1-t)$ = the Darby effect or the tax effect on the nominal interest rate. When the taxable interest rate is regressed on the tax free interest rate, the coefficient of i_2 should equal the Darby effect, according to Ayanian.

Ayanian uses one year Treasury bill rate as the taxable interest rate, and one year municipal bond yield as the tax free interest rate. Using the quarterly data for the period, 1952-79, he obtains the following regression equation:

$$i_1 = 0.158 + 1.63 i_2 \quad R^2 = 0.94 \quad (3)$$

(1.39) (42.89)*

The above regression equation is consistent with the hypothesis as expressed in Equation (2). That is, the constant term is not significantly different from 0. (The t-ratios are in parentheses). The coefficient of i_2 is positive and greater than 1.0, as is expected in Equation (2). Since $1/(1-t) = 1.63$, it implies that the implicit tax rate = 0.3865. That is, according to the Ayanian method, the implicit tax rate is 0.3865, and the Darby effect is 1.63. The one year Treasury bill rate is 1.63 times higher than the one year municipal bond yield due to taxability of the Treasury bond. That is, the Treasury bill rate is higher than the municipal bond yield by 63 % due to taxability!

The Ayanian method is a good approximate method in practical sense. However, strictly speaking, the method is not accurate. To test Equation (2), we have to choose two interest rates which have an identical risk, except for the tax status, since interest rates can be different if the risk is different. For this reason,

Ayanian chooses one Treasury bill and one prime grade municipal bond. The two securities may have almost the same risk, but we have to prove it. The municipal bond may have a higher default risk than the Treasury Bill. However, it is not shown whether the securities have also the same variability risk and the same inflation risk, for instance. Suppose that two securities have different risks in addition to the tax status differences. In such a case, Equation (1) should be rewritten as

$$i_1 (1-t) = i_2 \quad (4)$$

Thus, to convert inequality (4) into an equation, we can rewrite it as

$$i_1 (1-t) = a i_2 \quad (5)$$

where a = a constant, or a risk adjustment coefficient. Given Equation (5), it can be rewritten as

$$i_1 = (a/(1-t)) i_2 \quad (6)$$

Now compare Equations (3) and (6). The regression coefficient 1.63 would be the true Darby effect, $1/(1-t)$, only if $a = 1.0$. Suppose $a = 1.0$, and the true tax rate is 0.387. Then, the coefficient of $i_2 = 1.63$. Other combinations of the parameters are possible. If $a = 0.9$, then $t = 0.448$. If $a = 1.10$, then $t = 0.325$. Which t is the true tax rate? This is an unsolved question in the Ayanian method.

As an example, with annual data for the period 1950-83, regressing the AAA bond yield, the BBB bond yield, and the Treasury bill rate on the municipal bond yield, I obtained the following results:

$$i(\text{AAA}) = 0.0806 + 1.2866 i(\text{MB}) \quad R^2 = 0.9692 \quad (7) \\ (0.36) \quad (31.72)^*$$

$$DW = 0.6312$$

$$i(\text{BBB}) = 0.1545 + 1.4569 i(\text{MB}) \quad R^2 = 0.9783 \quad (8) \\ (0.74) \quad (37.98)^*$$

$$DW = 0.6833$$

$$i(\text{TB}) = -0.8900 + 1.1905 i(\text{MB}) \quad R^2 = 0.8445 \quad (9) \\ (-1.80)^* \quad (13.18)^* \quad DW = 1.0042$$

The implicit tax rates are 0.2228, 0.3136 and 0.16 in the above three equations, if $a=1.0$ (the t ratios are in parentheses).

¹ Ayanian, R.; "Expectation, Taxes and Interest: The Search for the Darby Effect", American Economic Review, Sept., 1983, pp. 762-65.

MONEY SUPPLY IN AN OPEN ECONOMY

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This paper deals with an analysis of the money supply mechanism in an attempt to determine the main sources of the expansion and changes in the stock of money and thus reveal the central bank's contribution to the determination and changes in the money supply. This kind of exposition of the money supply process provides an instrument and criteria for the evaluation of the ability of the central bank to influence the money supply as well as its performance in the control of money.

The most important source of the money supply is the monetary base or currency supplied by the central bank. Given the amount of currency in the economy, the nonbank public and the commercial banks as well as other financial institutions and the thrift institutions together make the next most important contribution to the determination and changes in the stock of money. The nonbank public's influence affects money supply through their cash versus deposit holding preferences. The higher the fraction of the currency left in the financial institutions in the form of deposits, the higher the ability of the institutions to expand the deposits into further deposits by making loans. Conversely, the higher the fraction of the currency held by the nonbank public in the form of cash, the less the ability of the banks to expand money supply.

As the above statement indicates, the banks also contribute significantly to the creation of and changes in money supply by their loan behavior, given the amount of deposits available to them. The method of money supply analysis used in this paper involves identifying the contribution to the level and changes in the money supply by the central bank through the monetary base, and by the nonbank public as well as the banking sector. The method and its model as developed by Friedman, Schwartz, and Cagan, assumed that the monetary base was under the control of the central bank and hence, the central bank was assumed to be responsible for the level as well as changes in the stock of money- if not completely, at least significantly enough to provide a criterion for the evaluation of the performance of the central bank.

The major deviation of this paper from the works of Friedman, Schwartz and Cagan is that here the ability of the central bank to control the monetary base is not taken for granted. In an open economy, the export and import sectors significantly influence the level of and changes in the monetary base, even though it is issued by the

central bank. Where the foreign sector of the economy is a dominant one, the level and changes in the exports and imports tend to dominate the level and changes in the currency in the economy and limit the ability of the central bank to control money supply, as the central bank cannot refuse to respond even reluctantly to the changing needs of the economy.

In applying the test of the model in an open economy, the methods of Friedman, Schwartz and Cagan were employed in an analysis of the money supply mechanism in a small open developing economy. The data manipulation, processing and computation were supplemented by techniques developed by Anderson and Jordan. The findings indicated that although the model may have performed reasonably well in an economy such as the U.S which is significantly dominated by the domestic sector, it did not indicate that the central bank had as much influence and control over the money supply in other economies where the foreign sectors were dominant.

The results supported the position of Williams, Mundell and Abramovitz that developments in the real sector had strong impact on the balance of payments and consequently on the money supply. It also supported the findings of a study by Aghevli that in the long run, money supply was determined mostly by the central bank's exogenous activities, but in the short run, changes in the money supply were induced by cyclical changes in business activity, and that the balance of payments responded to short-term variations in business activity and affected the money supply through international monetary flows.

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ABSTRACT
PHYSICIAN DIFFUSION - Some Places
Get More than their Share
by
C. Howard Davis

This paper adds to the understanding of the diffusion of physicians. Most of the current literature provides strong evidence that the market does indeed function to disperse physicians increasingly into previously lesser served areas. This paper looks at the process of diffusion in three selected States (Tennessee, Pennsylvania, and North Carolina) and attempts to identify some of the factors that influence the diffusion process. Shift-share analysis and regression techniques are used to examine the diffusion process that occurred between 1970 and 1980, but especially between 1975 and 1980. Shift-share analysis focused on comparing the change in physician numbers relative to population changes among major and minor urban and non-urban areas. Regression analysis is used to examine economic determinants that appear to influence physician movement.

Although not necessarily unique, the findings support studies that find that the diffusion is scarcely uniform and that certain areas persistently remain underserved. Considerable concentration is still occurring. Some communities attract physicians in numbers proportionally greater than would be accounted for by changes in population. Economic vitality of a community is an important determinant to attracting physicians. Also, the parameters of the three states were compared, and there appears to be considerable disparity in the response of physicians to similar explanatory variables among the three states.

ABSTRACT
THE LABOR SUPPLY OF NURSES: SOME COMPARISONS
BY JULIA LANE AND LAVONNE BOOTEN
Comments by
C. Howard Davis, Discussant

The authors of this paper investigate the supply function of nurses. They compare results using a Census data base with a survey of similar characteristics of nurses in the State of Ohio. Better results are obtained from the State survey data. The authors also employ a statistical innovation to cope with a bias problem that frequently emerges when investigating a labor market involving females.

The existence of this bias for nurses, which is essentially a female occupation, may not be particularly important. Nationwide, most of the 1.6 million registered nurses are in fact working and most of those who are not are over 50 years of age and presumably are not actively in the labor market. Since most nurses who want to work appear to be working, the bias may not be material in this particular case.

The authors presume that a "nurse shortage" exists although this no longer appears to be true, at least nationwide. Shortages may exist in particular areas, which is a matter of concern.

MEXICO'S BANK NATIONALIZATION AND BORDER BANKS:
AN IMPACT SURVEY

-A COMMENT-

Marian V. Heacock

University of Alabama at Birmingham

Professor Jerry Prock's paper on bank nationalization in Mexico and its resulting effects upon U.S. border banks is a provocative working paper, offering the opportunity for further study on the five-tier pricing structure for pesos with respect to the application of Multiple, Fixed, and Freely Fluctuating Exchange Rates within the Mexican banking community. As Flexible Exchange Rates were not implemented by the economic restrictions imposed in this tier structure, any future study should include an attempt to ascertain the reasons for this omission.

The thesis and findings indicate that this study should be expanded and developed for the purpose of collecting valuable statistical data which could provide a framework for expected banking trends between these two trading nations. The sampling methods employed in Professor Prock's study were limited by the availability of access to the Mexican banking system. The questionnaire employed was unstructured and conducted through verbal communication. Further study should consider a written and structured questionnaire. A comparative analysis of the sampled banks should include both asset and transactions levels of the Mexican and U.S. banks. Inclusion of this data would provide the base for verifiable and more reliable statistical analysis.

The behavioral portion of this study concludes that Mexican banking personnel perceive U.S. bankers as more professional in their dealings toward correspondent Mexican banks since nationalization. As a study apart, behavioral perceptions could establish an indicator as to future trends in Mexican-U.S. banking relations.

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