Faculty of Arts and Sciences
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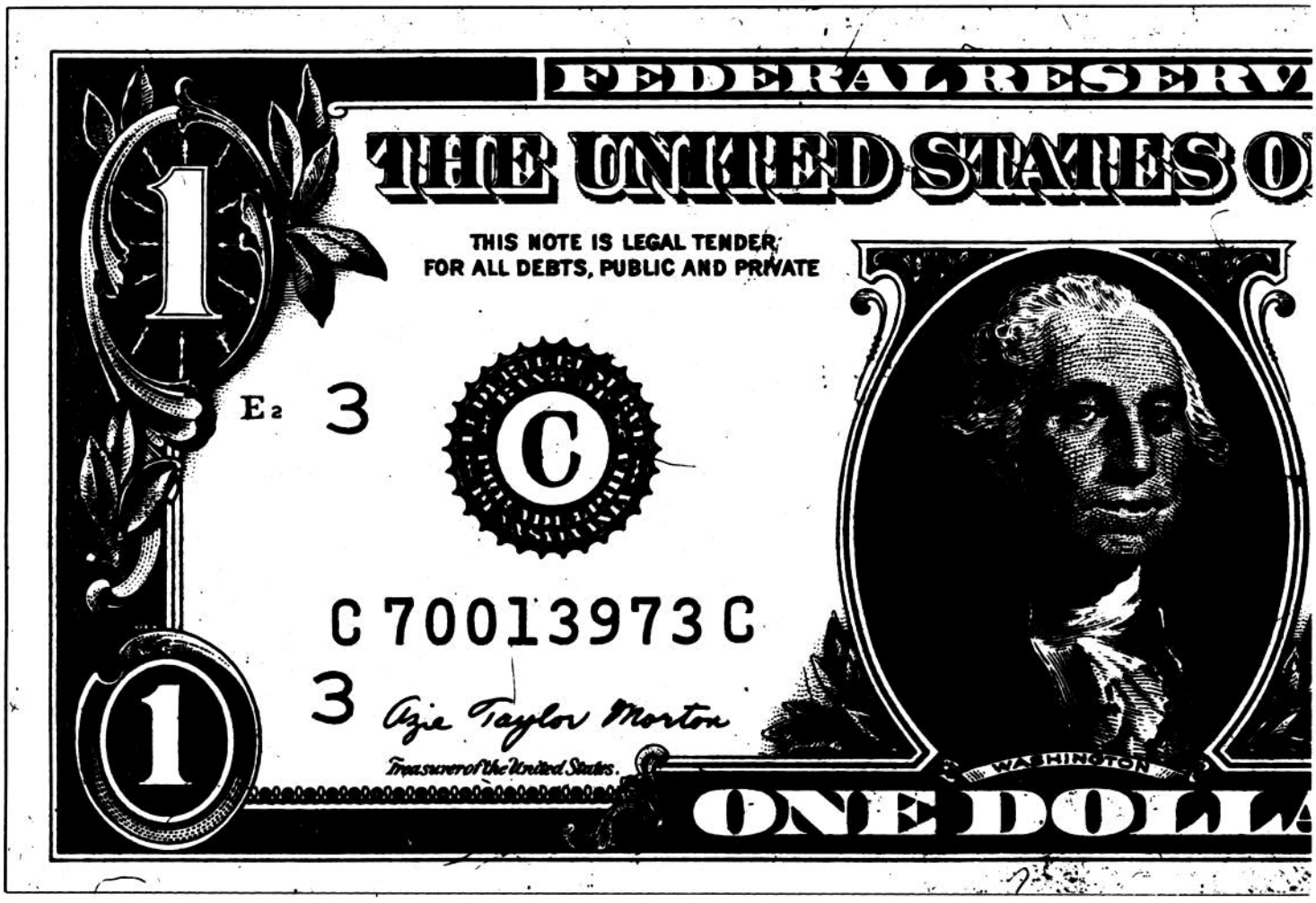
FAS reports

Economics at Pennsylvania

Pennsylvania's thirty-eight economists come from many quarters within the discipline. Some are advisers to presidents and congressmen. Others are plotting the underlying mathematical structure of economics. Few shun controversy. Here are a few examples of their ideas and their research.



After Launching An Industry, What Next?

From within our very ivory towers, Lawrence Klein and his colleagues have launched a worldwide industry known as econometric forecasting. Forecasts, which are the major product of this hundred million dollar a year industry, have become a basic economic planning tool for most of the key corporations in the world as well as for the United States and other governments.

Lawrence Klein, often referred to as the father of econometric forecasting, first developed the field in the late 40s and early 50s when he began building complex computer models of the economy which predict its future activity. He and his colleagues initiated an econometric forecasting system for business and government in 1963, and this later became the University-owned Wharton Econometric Forecasting Associates (WEFA).

The industry that these economists have created works from models, which are a series of interlocking mathematical equations plotting the relationships among a host of economic activities.

"The model is basically a computer program, which describes the behavior of the economy," explains F. Gerard Adams, director of the University's Economic Research Unit. "And if you press on the button an increase in government spending, then it feeds through all these channels and out comes an increase in GNP, prices and so on."

When Klein developed his first econometric model just after World War II, it consisted of about six equations. Today WEFA has massive models of the United States economy, some consisting of over 1,000 equations. It has developed models ranging from the economy of the world to an individual steel company, from the state of Mississippi to agriculture in the United States.

With these models economists predict what the economy will do quarters or years ahead. They test the impact of different policies and programs or such dramatic economic shifts as an oil price increase or a new gasoline tax.

At WEFA well over 300 firms, including such giants as Weyerhauser, IBM and EXXON, subscribe to the forecasting service and can pose their own problems for the WEFA models. These firms can also develop their own satellite models at WEFA so that whenever the WEFA model is providing data on the U.S. economy, they receive data on how this will affect their own corporations.

Today the forecasting industry is growing at a rate of twenty to thirty percent a year, so fast that WEFA needs more and more capital to keep its position as one of the top three firms in the country. Thus Penn's Trustees sold WEFA this spring to the Ziff Corporation, a New York special interest publisher, which can provide the several million dollars for the capital investments that WEFA must have to compete effectively among the growing number of forecasting services.

For the University, WEFA's sale means an endowed Economic Research Institute and a professorship as well as an outright million dollars and a twenty percent interest in the organization until 1985. The University will have access to WEFA's models and the data base for the use of its students and faculty in both teaching and research. WEFA's Chairman, Lawrence Klein, and its Secretary, F. Gerard Adams, will continue as consultants.

But developing econometric forecasting for the business community is only the beginning for these Pennsylvania economists. The Chinese Academy of Social Sciences has invited Lawrence Klein to direct a seven-week summer institute for Chinese economists on econometrics. This summer he and five other Americans will fly to China to present the theories and techniques of econometric modeling to Chinese scholars and government officials. Their work will be aided by a mini computer, models of the U.S. economy, and a simple model of China, which Klein hopes to improve with information garnered during his stay.

The Chinese program is only the most recent example of Klein's interest in promoting econometrics on a world scale. The econometrics group just celebrated the tenth anniversary of the Mexican Econometric Forecasting Project, which is used by the Mexican government, four provinces, several major corporations with business interests in Mexico, and PEMEX, Mexico's oil development agency. In this ten year period, the group has made models of countries ranging from Brazil to the Soviet Union and on issues ranging from commodities markets to centrally planned economies. The group's most comprehensive undertaking is Project LINK, an economics department project. A model of the world started in 1969, Project LINK has now been expanded to contain interlocking models of some twenty-five countries and developing regional areas.

It is to these international projects that Klein is looking in his future program. He wants to modify the world models so that they better address the problems of widely fluctuating currencies and the great influx of capital in the developing countries. He has just completed, with doctoral candidate Dae Choi, a project for the European Common Market to assess the impact of their new limits on currency fluctuations. For this project he has modeled fluctuations in European currencies relative to factors such as inflation, interest rates, savings and several other aspects of the economy. These factors, he believes, determine where people will buy and sell their money and thus which countries' money will increase or diminish in value.

Adams is looking to different problems. He hopes to come up with a better way for the models to incorporate how people's expectations influence the economy. In addition he wants to improve the way models reflect how people respond to government policy. Adams is anxious to return to an old interest in energy economics and plans first to look at petroleum in a fashion similar to the way he considered commodities (see page 4).

While the University's era of WEFA is coming to an end, this is not true of what Nobel Laureate Paul Samuelson has described as the Age of Klein in econometrics. Whether they are called upon to help assess the impact of mining magnesium nodules from the ocean floor or to advise President Carter on solutions to double-digit inflation, Klein and his colleagues will continue to broaden their field—and our economic perspectives.

College Enrollment: An Optimistic Outlook

"I wouldn't be surprised if the percentage of young people going to college increases at least enough to stabilize college enrollment if not to increase it," predicts Richard A. Easterlin of the coming decade.

This music to the University's ears is only the beginning of the glad tidings of this Pennsylvania economist, demographer and former associate dean of FAS. His optimistic theories, developed with economics professor Michael Wachter and Susan Wachter, associate professor of finance, extend to reduced unemployment and prosperity for the years ahead.

This optimism stems from Easterlin's theory that times are better when the society has comparatively few young adults, and this will be the case in the next decade and a half. Easterlin believes that people's lives are greatly affected by the size of their birth cohort, that is the number of people born in the same year. And this in turn has a big impact on society as they become young adults. For people born in a year with a great many others, life is harder—schools are not big enough, competition for college is stiff, jobs are more difficult to come by and to advance in, and unemployment is higher. People thus tend to wait to get married and as a result have fewer children. Conversely, those born in a year with fewer people have a much easier time in getting an education and a job and advancing in their field. Thus they marry earlier and have more children since they are better able to afford it, according to Easterlin.

Easterlin's theory is unusual because it describes both the baby boom of the years 1945 to 1960 and the baby bust that has been taking place since 1960. In the post-war period, the young adults were the men and women born during the depression--a time of relatively few births. These people discovered that jobs were relatively easy to find and opportunities for advancement were much more plentiful for them than they had been for their parents. They married relatively early and began their families, thus producing the baby boom. Their children, however, grew to adulthood amidst crowded classrooms and hard times finding jobs, particularly when they compared their experiences to those of their parents. These people waited to get married and have families and thus created the baby bust.

The people who were born during the baby bust are now approaching college age. As a result the number of college age people will decline twenty percent between now and the mid-80s and another twenty percent between the late 80s and the mid-90s. These figures have created the widely publicized fears that colleges and universities simply will not have enough students, and some may even be forced to close.

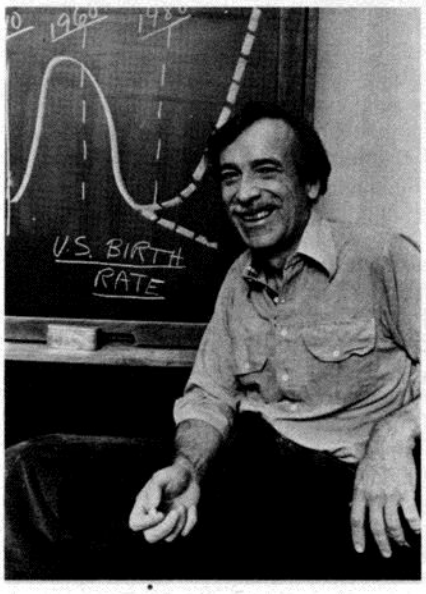
The real question in Easterlin's mind is what is going to happen to college *enrollment rates,* that is the proportion of people eighteen to twenty-one years old who go to college. Easterlin feels that enrollment rates are sensitive to the size of the college age cohort in two ways. Drawing on the work of Michigan sociologist David Goldberg, he notes that it is easier for parents to send their children to college when they have fewer children in their family. In the past decade college students have come from the larger families created during the baby boom. Thus it has been relatively difficult for families to send all of their children to college. In the decades ahead the children born to the smaller families created during the baby bust will turn college age. These smaller families will find it easier to send their children to college, and thus the percentage of people eighteen to twenty-one who go to college should increase.

Moreover Easterlin and Michael Wachter have done work that shows that when large numbers of young adults enter the labor market, they depress earnings, and this phenomenon is particularly true for college-educated people. Since fewer young adults will be entering the labor market in the decade ahead, demand will increase, and earnings will begin to rise, especially for college educated people. It therefore follows that more young people will choose to go to college.

"Therefore, my expectation is, and I think it's consistent with the past, that enrollment rates will be moving up in conjunction with the college-age population," says Easterlin.

Not only will a higher population of young people go to college in the coming decade, but they will also have an easier time finding jobs and advancing in their careers, according to Easterlin, Michael Wachter and Susan Wachter. These economists therefore predict a decrease in unemployment.

Their research shows that even in the best of times young workers have higher unemployment rates than older workers. People born in the baby boom not only experienced unemployment because of their age, but they were competing with so many others of their age for entry level jobs that their unemployment rates were higher than that of the previous cohorts. As society now goes from a very large proportion of younger workers in the work force to a smaller percentage of younger workers with the arrival of the offspring of the baby bust, the unemployment rates are going to decline, they believe.

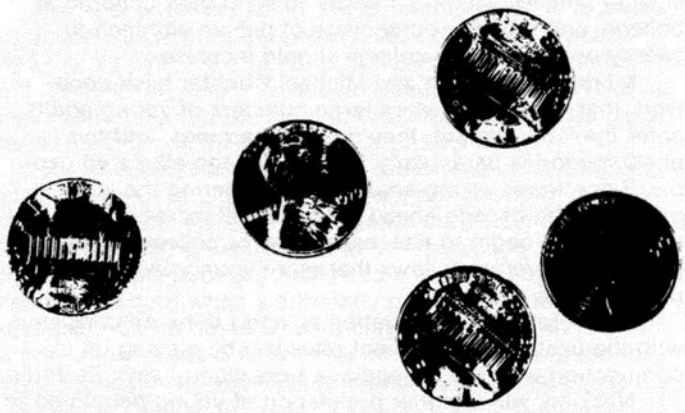


Richard A. Easterlin

Photo by Larry Kanevesky

Not only will a higher population of young people go to college in the coming decade, but they will also have an easier time finding jobs and advancing in their careers...

The Cost of Fixing Commodities Prices



... the whole national economy would be affected by price stabilization, and this must be considered as a country makes its decision on such international accords.

Would OPEC style price agreements for commodities like copper or coffee lead to a worldwide depression?

Not necessarily, explains F. Gerard Adams, who with Jere R. Behrman has been studying what would happen to both developing and developed nations if countries that produce commodities such as copper, cobalt, coffee or magnesium agree to stabilize prices.

"If you pay more for copper and the copper producing country uses that money to buy industrial products, then the effect is different than if you pay more for oil and the oil producing country invests in gold," explains Adams. "By investing in industrial products, the copper producing countries are providing a market for the economies of the developed countries, while buying gold has no such positive impact."

Behrman and Adams first looked at the way such price stabilization would affect the developing countries themselves. They took on this study in response to a request from the United Nations Conference on Trade and Economic Development (UNCTED), which in 1976 called for a new international economic order and a program of price stabilization for ten commodities.

Adams and Behrman evaluated the effects of these price stabilization programs on ten individual countries: Brazil, Ivory Coast, Zambia, Chile and six Central American countries. The Penn economists and their graduate students used three models--one of the country's economy as a whole (including indicators of growth, income distribution, inflation, and degree of economic stability), one of the commodity producing sectors within each country, and one of the international copper and coffee markets. They discovered that the impact of price stabilization on the country's economy as a whole is much greater than it is on the particular sector that is producing coffee or copper. Price stabilization might, for example, lead to more tax revenues for the government or higher wages throughout the country since the producing industries tend to set wages that are followed in other industries. Stabilization of prices would also definitely affect the country's foreign exchange revenues. Initially these revenues would probably increase. Later, however, foreign exchange revenues might decrease, since people would have more money and would thus want more imported goods. They also discovered that fluctuations in the price of a commodity were not uniformly bad. With fewer fluctuations it appears there would be higher growth, yet income would be distributed less equitably. In short, the whole national economy would be affected by price stabilization, and this must be considered as a country makes its decision on such international accords.

Adams also asked what would happen to the developed countries if agreements on commodities prices were reached. To answer this question, he joined twenty different models of commodities markets with the LINK model of the world economy developed in the economics department. The system of national models and models of commodities markets enabled him to find out how much economic activity a developed country would experience and what their earnings would be at given prices for the commodity.

He discovered that if the developing countries agree to stabilize prices, it will certainly lead to higher commodities prices and thus inflation in the developed countries. This, however, does not necessarily mean a depression. Unlike the oil producing countries, the copper and coffee producing countries can and do spend all the money they receive from commodities on products and services which in turn stimulates the economies in the developed world. The oil producing countries on the other hand just cannot spend it all. A critical factor, therefore, is where and how the revenues from the commodities are spent.

Another key is how the developed countries react to the inflation, Adams believes. If they refuse to accept the inflation and try to control it, they can then drive themselves into a depression, he asserts.

Yardsticks for Comparing the Wealth of Nations

The prices of jeeps in Japan, shoelaces in Sierra Leone or postal workers' salaries in Paris all funnel from statisticians around the world to researchers at the International Comparison Project. Once in a great while the project's founder, Pennsylvania economist Irving B. Kravis, even takes up the search. Thus on his recent trip to China, he jotted down the cost of everything from socks to theater tickets.

All of this data has enabled Kravis and his colleagues, Alan W. Heston and Robert Summers, to develop a new method for comparing the prices and Gross Domestic Products (GDP) of the countries in the world. Their techniques replaced the old and less accurate method of comparing prices and Gross Domestic Products by calculating these national figures in U.S. dollars at the current foreign exchange rates and comparing the converted figures. The International Comparison Project began in 1968 as a joint project with the United Nations and has been supported in part by the World Bank. It is now being turned over completely to the U.N. Statistical Office. The project gathers very specific data on prices within each country under study, compiles this data into an average set of prices for all the world, and then uses these world prices to put price tags on the items in each country's Gross Domestic Product (GDP). They can then compare GDPs among nations as well as the prices of the same goods in different countries and the relative importance of consumer goods, investment and government spending. (The U.N. uses the Gross Domestic Product concept rather than the Gross National Product since the GDP measures the income and output produced within the country leaving out the income produced abroad by a country's citizens.)

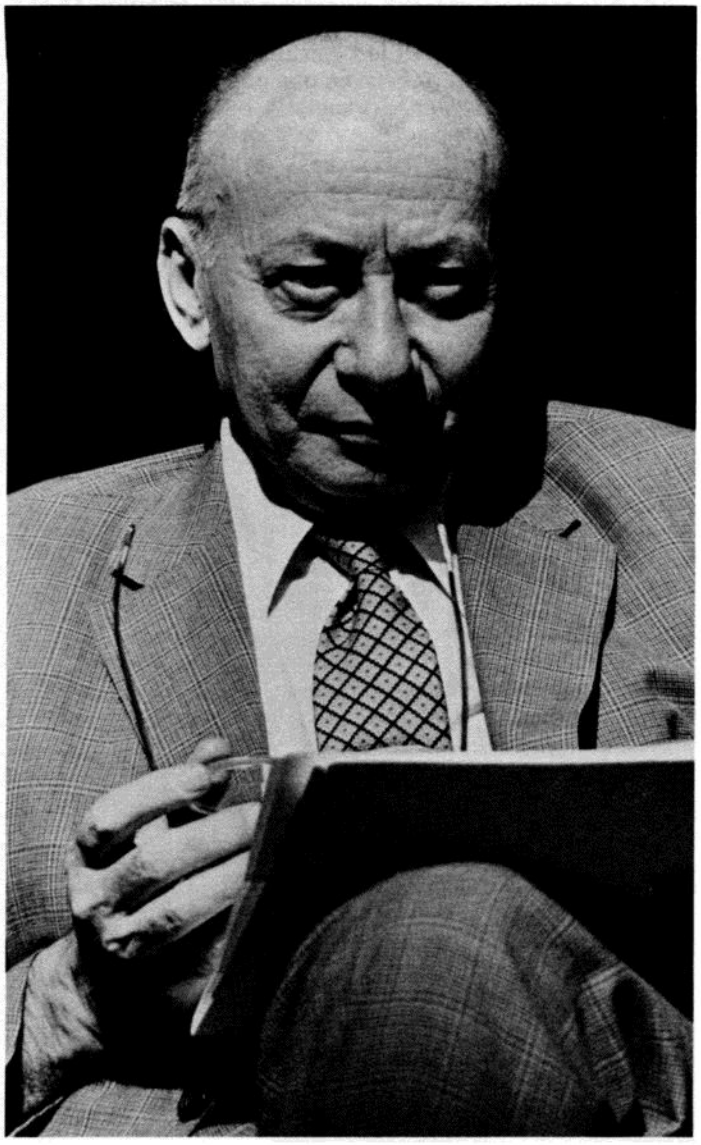
The International Comparison Project is more accurate than the traditional method because it deals with the problem of different values for the same goods within different countries. For example, domestic servants, who are quite expensive for Americans, are relatively cheap in India. If American price tags are put on all goods and services in India, the large quantity and high price of India's domestic servants would jack up their Gross Domestic Product well beyond what the GDP would have been had it been based on Indian rupees. Thus the international averages developed by Kravis, Heston and Summers help economists and governments see these domestic differences in a world perspective.

The comparisions are yardsticks for measuring the national economies of the world and are equally important tools in policy making. Organizations such as the World Bank decide which countries should be given priority for loans at terms lower than market rates of interest according to their GDP. The United Nations and NATO may use these comparative data to determine how much each country should contribute to these international organizations.

The comparisons are also giving international economists new information on world economics. Among many other things, they have discovered that the traditional exchange rate method of comparison dramatically underestimates the wealth of poorer countries in comparison with richer countries: the poorer the country, the greater is the understatement of its Gross Domestic Product. In 1970 for example, Colombia's Gross Domestic Product was 7.24 percent of the United States GDP by the exchange rate method of comparison and was 18.1 percent of the United States GDP by the method developed by the International Comparison Project.

They have also found that the price differences between countries decreased from 1950 to 1970 and have been increasing since 1970 when the exchange rates have been allowed to fluctuate. The depreciation of the dollar during this period accounts for reports claiming that the United States has lost its position as the nation with the highest per capita income in the world. However, with figures from the International Comparison Project, Pennsylvania economists have shown that in actuality only one or two small oil rich nations rank higher than the United States.

Irving B. Kravis



New Links for Economics and Organization Theory

Oliver E. Williamson's work on transaction cost economics offers a new point of view with which to assess markets and the organization of the modern corporation.

While economists have long been interested in markets, organization theorists and executives have been preoccupied mainly with the internal organization of the business firm. Williamson takes the position that markets and internal organization need to be studied together. To do so he uses the transaction as the basic unit of analysis.

Transactions occur when the ownership or control of goods or services is transferred from one group to another. They take place, for example, when a product moves from the manufacturing department to the marketing department or from one stage of production to a second stage. They also come about when a company purchases equipment or materials from another, when a corporation contracts to supply a key process in another company's production, or when management reaches an agreement with labor. At these critical points, things can flow smoothly or become very costly depending on how effective and appropriate the type of organization is for governing the specific transaction.

Oliver E. Williamson

The transaction cost approach can help a firm determine whether it is more efficient to purchase a good or service from another organization or do the work itself. It can also be applied to the question of what kind of contract should govern transactions between two companies. This approach can assist management in deciding how to organize its staff and resources to govern internal activity. Finally it can help policy makers decide what kinds of government regulation best protect the public interest with certain types of transactions.

Williamson's unusual background contributed to his interest in transaction cost economics. Trained originally as an engineer, Williamson worked for the U.S. government as a project engineer, overseeing government contracts with large corporations. He became fascinated with these complex organizations and decided to get his MBA at Stanford, where he discovered that economics was his real interest. He transferred to Carnegie-Mellon, which in the 1960s emphasized interdisciplinary studies in economics and organization theory. What he found missing from the behavioral approach to organization theory at Carnegie, however, was a system for incorporating efficiency. The transaction cost approach supplies the necessary link between economics and organization theory.

He has identified three critical elements that describe transactions and their costs: the frequency with which a transaction occurs, the degree of uncertainty surrounding it, and the necessary transaction specific investments, that is investments which are useful only for the given transaction (or related set of transactions). These investments, such as specialized equipment which cannot be used productively for other purposes, are the most critical and previously overlooked element in transactions, according to Williamson.

If a transaction is subject to a great deal of uncertainty, is done frequently and involves transaction specific investment, Williamson feels that its success depends upon a governance system that promotes harmony and encourages the parties to continue the exchange. For example, this might mean having the two parties under the same management. In contrast, infrequent, predictable transactions, which involve no specific investment are usually controlled by forces beyond the two parties such as competition in the marketplace.

The applications of this theory are far-reaching. Williamson is now working with William Ouchi, an organizational theorist from UCLA, to design internal organization structures that are matched to the needs of differing transactions. He is writing a book applying transaction costs to antitrust economics and is also working to refine, improve and test his theories.

"The evidence supports the proposition that organization structure is explained in significant part by transaction cost considerations, and I think we will see extensive applications of it within organization theory in the next ten years," Williamson concludes.

Education's Surprising Side Effects

Education is not very likely to increase income at age fifty, but it could well mean a longer life if you are a white male, according to the studies by Paul J. Taubman, chairman of the economics department.

Taubman and Jere R. Behrman conducted a wide-ranging study to see what affects a person's mature income, that is their earnings at age fifty to fifty-five. They used a national sample of twins for this research so that they could control as many factors as possible. When they treated the people in the sample as individuals, each additional year of schooling added about eight percent to a person's earnings. Within pairs of identical twins, however, while most other factors were held constant, each additional year of schooling added only about four-and-one-half percent to a person's mature earnings. This led them to conclude that education is a relatively insignificant factor in determining income at age fifty or fifty-five.

Nor did life after graduation have an overwhelming impact on earnings and occupational status, they found.

"Generally, it seems plausible that as you have exposures to different environments and experiences that whatever happened back there in your family is less and less important," explains Jere Behrman. "But our studies are saying that still family background carries through in a very significant way over the complete life-cycle."

In a separate study of mortality among different socio-economic groups, Paul Taubman found that among white males, the death rates at each specific age are much lower for more educated men. For men over sixty-five there is a twelve percent death rate during a three-year period for college graduates and a twenty percent death rate for elementary school graduates. Taubman found roughly the same pattern for younger men as well.

He was able to compare his findings with a similar study that was done by others in 1960. This study came up with essentially the same results as Taubman's for younger men. For older white men, however, the 1960 study found absolutely no difference between college graduates and elementary school graduates.

Why are white men with less education now dying at such higher rates during a period when the government has introduced Medicare and food stamps and increased the real value of social security payments?

Taubman doesn't know, but he has some interesting speculations. One possibility is that these people have cancer or other occupationally related diseases that are more likely to occur in working-class people. Another hypothesis is that people with more education may respond more quickly to information about their health. They may have given up cigarette smoking more quickly, or perhaps they are more conscious of keeping their weight low or cutting down on such reputedly harmful substances as cholesterol in their diet.

Taubman is now looking at other samples to shed some light on these intriguing questions as well as pursuing his work on what influences mature earnings. He and Jere Behrman now plan to study the children of twins in his original sample to see what happens to earnings in the next generation and whether education remains fairly insignificant to income in later life.

Is Money What We Think It Is?

If it were up to economic theorists Karl Shell and David Cass, most of the economists in the nation would be sent back to their desks.

"We certainly don't have enough information to know how to tell policy makers how to behave. Anybody in economics who tells you otherwise is just telling you nonsense as far as I'm concerned," asserts David Cass. "We don't have anything like complete theoretical structures."

Thus these professors and their dozen colleagues in the Center for Analytic Research in Economics and the Social Sciences (CARESS) are hard at the task of developing the theoretical underpinnings for economics. Among the many projects currently underway in CARESS are abstract investigations of such fundamental, persistent questions as what determines the price level in a free economy? How well do markets allocate resources in the presence of economic uncertainty? What social institutions can be utilized to achieve equitable collective decisions?

Several CARESS members are working, for instance, on the theory of money. Money, they claim, has never been incorporated into a full-fledged model of the economy.

"There's been a special theory--a sort of black-magic type of theory--which monetary economists have been employing," explains Karl Shell. Most theoretical economists, he continues, have focused on resource allocation and on markets, those abstract places where goods and services are exchanged. Money has been viewed as representing the ratio of exchange among resources--or the number of apples you need to buy an orange.

In the past several years, Cass, Shell and other professors at CARESS have worked on developing a theory that begins to integrate money and financial institutions into a private market economy. They have thus far demonstrated that money is worth what we think it is. While the essence of this theory is mathematical, they explain it with the common-sense notion that on the day before the end of the world, people would not accept money, for it would have no value. People would believe it to be worthless, and this would make it so. They also defined this position by citing people's reaction in periods of fantastic inflation in such countries as Germany after World War II or Chile in the 1950s. In those times people refused to hold money. They bartered for goods and services rather than accepting the worthless paper.

If as Shell and Cass contend, money is worth what we think it is, the policy implications are somewhat staggering. How, for example, can we expect to engineer the value of money by having the Federal Reserve Bank release or withhold money from the economy unless we know whether and how the actions of the Federal Reserve will affect people's expectations and economic behavior? In their opinion we have no such understanding. We do not have models to show us how the government's actions affect the rest of the economy.

The challenge ahead for these theoretical economists is to model how people come to hold these beliefs. They are now trying to plot the way people learn about the value of money and to predict its value. They must also find out how people react to their own predictions, both good and bad, and modify their views.

Faculty Members in the Department of Economics

F. Gerard Adams, professor of economics and finance and senior consultant and secretary of Wharton Econometric Forecasting Associates, has worked on a broad range of topics in applied econometrics, including macro models and forecasting, international trade, energy, commodities, and regional economics.
Beth Allen, assistant professor of economics, is involved with microeconomic theory, general equilibrium theory, and mathematical economics. She is currently working on economies with uncertainty and the inclusion of traders' information in formal economic models of consumers' behavior.
Albert Ando, professor of economics and finance, is doing research on macroeconomic theory and stabilization policies, econometrics, and the interaction between real and monetary factors in economic systems.
Constantine Azariadis, associate professor of economics, studies the economics of labor contracts as well as monetary policy.
Jere Behrman, professor of economics, concentrates on economic factors in less developed countries, including labor, marital stability, fertility, the role of women and levels of education.
Douglas Blair, assistant professor of economics, is currently involved with research on the theoretical aspects of voting systems and the behavior and economic effects of labor unions.
Arthur I. Bloomfield, professor of economics, teaches and does research on international economics and the history of economic analysis.
David Cass, professor of economics and co-director of the Center for Analytic Research in Economics and the Social Sciences, is working on inter-temporal economics which involves microeconomic-monetary theory.
David Crawford, assistant professor of economics, is studying labor economics as well as econometrics and income taxes.
Jacques Cremer, assistant professor of economics, is doing work on planning theory, development planning and the oil market.
Richard Easterlin, William, R. Kenan, Jr. professor of economics, is an economist and demographer who studies fertility experience in both developed and developing countries.
Wilfred Ethier, professor of economics, studies monetary theory and international trade.
Claudia Goldin, associate professor of economics, is studying the economics of slavery in the American urban south. In addition. Professor Goldin is studying changes in the female labor force and the transformation of the American household.
Arleigh P. Hess, Jr., associate professor of economics, has worked on many aspects of international banking.
Lawrence R. Klein, Benjamin Franklin Professor of Economics and Finance, and chairman of Wharton Econometric Forecasting Associates, is concerned largely with econometrics and applications to economic policy, both domestic and international.
Irving B. Kravis, professor of economics, has done studies in international trade and in comparisons of prices, income, income distribution, and productivity.
Herbert S. Levine, professor of economics, is the chairman of the board of trustees of the National Council of Soviet and East European Research. Professor Levine has done research on economic planning in the Soviet and East European economies.
Lucinda Lewis, assistant professor of economics, works in the areas of public finance and econometrics.
Wilfred Malenbaum, professor of economics, is studying the economies of long underdeveloped countries and how they use natural and human resources. Professor Malenbaum is also doing research on health in poor countries, with an emphasis on the Indian economy.
Edwin Mansfield, professor of economics, was the first American economist invited by the People's Republic of China to lecture there under the Sino-U.S. scientific interchange. His work ranges from industrial organization to the economics of technological change.
Roberto Mariano, associate professor of economics, is an econometrician studying economic statistical models on commodities, including tin, rubber and wheat. He is also involved with studies on the economy of the Phillipines.
Jeffrey M. Perloff, assistant professor of economics, is working in the areas of labor economics, law and economics, and industrial organization.
Almarin Phillips, professor of economics, is doing research in the areas of industrial organization and public policy.
Robert A. Pollak, professor of economics and public policy, is the editor of *International Economic Review.* His main research interests are household behavior, the cost of living index, and the theory of social choice.
Djavad Salehi-Isfahani, assistant professor of economics, is involved with population economics and econometrics, particularly in agricultural societies.
Laurence Seidman, assistant professor of economics and health care systems, specializes in national health insurance, inflation and unemployment.
Karl Shell, professor of economics and public policy, is the co-director of the Center for Analytic Research in Economics and Social Sciences, and the editor-in-chief of the *Journal on Economic Theory.* Professor Shell is an economic theorist whose work focuses on monetary and fiscal policy models.
Robert J. Shiller, associate professor, is studying how interest rates relate to inflation and how expectations fit into the business cycle.
Robert Summers, professor of economics, teaches applied econometrics, statistics, and the distribution of income. In his research, he makes international comparisons of national income and prices and the inequalities in the world distribution of income.
Paul Taubman, professor and chairman of economics, works in the human resource area. In particular he is studying the reasons for differences in individual earnings and the differences in morbidity and mortality for socioeconomic groups.
Michael L. Wachter, professor of economics and commissioner on the Minimum Wage Commission, does research in the areas of inflation, unemployment, and productivity. He is currently finishing a book on youth unemployment.
Sidney Weintraub, professor of economics, is an economic theorist and economic historian. He is currently doing work on the modern history of capitalism.
Anne D. Williams, assistant professor of economics, is working on economic demography, and in particular on fertility determinants.
Oliver Williamson, Day professor of economics, social science, law and public policy, is studying firm and market organization with special emphasis on transaction costs. His work can be applied to the modern corporation, the study of regulation, and antitrust policy.
Asad Zaman, assistant professor of economics, is doing research in the area of statistical decision theory and its applications to econometrics. He is also interested in game theory.

FAS Reports: A Supplement to Almanac

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