

Economic Man vs. Social Man

The Geography of Crime

A Noneconomist's  
Nonmathematical Guide to  
Econometric Forecasting



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# Economic Man vs. Social Man\*

by David P. Eastburn, President,  
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With attention focused on violence in the Parrot's Beak, Kent State, and countless city streets, there is danger of losing sight of a desperate conflict underlying much of the violence. This is the conflict between Economic Man and Social Man.

Each of us, of course, is both Economic and Social Man. Each of us is concerned with making a living and with living with his fellows, but the mix varies, and it is there that the source of conflict lies. Those who are 90 per cent Economic Man see today's world differently from those who are 90 per cent Social Man. Many, in whom the proportions more nearly approach 50-50, are torn apart by conflicting beliefs. And so we have a kind of national schizophrenia which is both divisive and debilitating.

It is easy, of course, to overdraw the contrast between economic and social values, but as a first approximation, let us consider the following shorthand description of characteristics and concerns:

<b>Economic Man</b>	<b>Social Man</b>
Production . . . . .	Distribution
Quantity . . . . .	Quality
Goods and services . . . . .	People
Money values . . . . .	Human values
Work and discipline . . . . .	Self-realization
Competition . . . . .	Cooperation
Laissez-faire . . . . .	Involvement
Inflation . . . . .	Unemployment

Economic Man tends to be concerned primarily with producing goods and services, with quantitative problems. He is largely responsible for the doubling in the nation's real output over the past quarter of a century. Ironically, however, his very success has made it possible for Social Man to gain a sympathetic hearing for his

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concerns about the *distribution* of output and the *quality* of life. The turning point for many was the appearance of J. K. Galbraith's *The Affluent Society* in the late 1950's. Galbraith made a persuasive argument that the problem of production in this nation has been solved. It is no coincidence that the war on poverty followed in the 1960's and concern for the environment promises to be the issue of the 1970's.

Economic Man embodies many of the values of the Establishment which youth today finds so distasteful. He believes that a relatively free pursuit of self-interest has served this nation well; that self-interest in a market economy is expressed largely in monetary terms; that monetary rewards are directed by competition to the efficient and enterprising; and that the Puritan Ethic of hard work and self-discipline is still a major guidepost to the good life.

Social Man sees the good life reached by a quite different route. He stresses people rather than things; human rather than monetary values; and freedom not to pursue one's self-interest but to realize one's true individuality by involvement in a cooperative way in solving society's problems.

Obviously, these are caricatures, not carefully toned portraits, yet it is precisely because such black-and-white conceptions exist that much of the current conflict is possible.

Consider, for example, the present effort of the Federal Government to steer a narrow course between inflation and recession. This task is made particularly difficult because of the clash of economic and social values.

In the 1920's the problem was simpler. When inflation got out of hand, the orthodox solution was to clamp down on the economy. In the ensuing recession, men were unemployed, but prices came down. Recession was believed to

be not only inevitable but a necessary purgative; it was the bitter medicine we had to take for living it up.

The Great Depression changed this view. It brought home the tremendous costs of idleness, the psychological maiming of a whole generation. Consequently the nation resolved in the Employment Act of 1946 to prevent a recurrence of such disaster. The idea of the inevitability of milder recessions persisted during the 1950's, however.

In the 1960's the public began to hope that recessions might be avoided altogether, and as the decade proceeded, this hope was increasingly bolstered by unprecedented success in keeping the economy growing. It was about at this time also that the nation became increasingly conscious that everything was not well socially. And as prices rose at a quickening pace in the latter 60's, public authorities became confronted with a dilemma more perplexing than ever before: how to curb inflation without incurring recession. The dilemma is now in its acute phase.

Economic Man is on one side. He has been telling the authorities: hang on; don't let up on efforts to curb inflation until you really have it licked; if this means recession, better pay the price now than a bigger one later.

Social Man is on the other side. He fears that a recession will hurt most those who are already disadvantaged. When unemployment rises, as it must when the economy slows, those who are laid off first are the unskilled; efforts to recruit workers from the ghetto are suspended. Social Man, therefore, is inclined to trade inflation for jobs.

It is not exactly clear why these positions are held as firmly as they are. There are economic and social costs in both inflation and recession.

Both ultimately can destroy our economy. Both cause severe distress to important groups in society (10 per cent of the population, for example, is over 65, many on fixed incomes that are eaten up by inflation; 7.6 per cent are working poor, many of whom are put out of work in recessions). The fact is, however, that Economic Man tends to be concerned primarily about inflation and Social Man about recession, and so an issue of great significance to the entire nation has tended to become polarized.

It is a truism to say that the only reliable road to lasting domestic peace is through understanding. It may well be, however, that controversy between races and generations contains such a large component of emotion that a frontal attack will only produce more discord. Better understanding of underlying economic and social issues may promise quicker results. A question of considerable significance, therefore, is what can Economic Man and Social Man learn from each other?

Social Man must convince Economic Man that this nation cannot prosper unless action is taken to solve social ills. A great deal of progress has already been made. Indeed, historians may note some day that one of the most outstanding achievements of the twentieth century was the softening of a harsh and inhuman economic philosophy, a process which has yielded unprecedented economic as well as social dividends. It is impossible, for example, to visualize anyone today (except possibly Ayn Rand and her disciples) seriously subscribing to Herbert Spencer's philosophy of 1850:

. . . The poverty of the incapable, the distresses that come upon the imprudent, the starvation of the idle, and those shoulderings aside of the weak by the strong, which leave so many "in shallows and in miseries," are the decrees of a large, far-seeing benevolence.

Social action taken in the 1930's and since has brought us a great distance.

Tacked on to the end of this long-run trend has been a new awareness on the part of corporations in the past decade of their social responsibilities. Motivations behind this latest development are varied, but for the most part are perfectly consistent with the traditional forces of self-interest that drive Economic Man. Looking to the longer run, businessmen see growing markets among Negroes, a supply of manpower from the ghetto, and good will from efforts to improve the environment.

All this has become the conventional wisdom as far as Economic Man is concerned. He may be less aware, however, of an equally valuable benefit from social action: it can enhance the possibility that public authorities might achieve a stable economy. Unemployment compensation and minimum income maintenance provide buffers between the disadvantaged and recession. Better training and education make it possible for those who are presently disadvantaged to hold their own in recession. If public authorities could gain more assurance that their actions will not bear down unfairly on the poor and greater confidence that their economic policies will not have severe social side effects, they could move with more vigor and effectiveness against inflation whenever it threatened. Social action, in short, promises Economic Man not only expanding markets in which to sell his wares but a more stable economy in which to produce them. Economic Man need not become a bleeding-heart liberal to espouse social programs to improve the lot of the disadvantaged. They are in his own self-interest.

At the same time, Social Man needs to understand what to Economic Man is a central concept of life: opportunity costs. This is the

concept that everything has a cost in terms of opportunities foregone. Resources are scarce and once a decision is made to use them for one purpose, they are no longer available for another. One opportunity cost of reading this article, for example, is not simultaneously being able to read one of the others in this magazine.

Economic Man, by and large, has learned to live with this principle. He is constantly forced to use the resources at his command—money, people, technology—in the best possible way to get the best possible results. His success in doing so determines his success as a businessman. He makes his cost calculations carefully; he sets priorities. He has developed a degree of patience and a way of looking toward the long run in evaluating progress and results. Social Man, by and large, has yet to get the message. Perhaps because of his “human” approach, he tends more often to look at small parts of the picture, sees specific problems which could be met with relatively small expenditure, and presses for their solution without realizing the cumulative implications of his proposals. With so many things needing doing, he is impatient for results. If Economic Man can—without dulling the edge of the drive for social betterment—convince Social Man that everything cannot be achieved at once, he will have gone a long way toward a constructive resolution of today’s conflict. Rising expectations are healthy, but only if we are aware of the limitations of resources.

Resources are expansible, but in the short run, attempts to do too much, to solve all our social problems and still satisfy our inexhaustible

desires for material things, will only produce inflation. Limited resources force us to make hard decisions about priorities. The sooner Social Man learns this economic lesson and devotes his efforts to winning the public over to *his* order of priorities, to giving him a bigger slice of the pie, the more effective he will be in solving social problems.

In the longer run, it is possible to meet rising social needs without sacrificing material comforts; the slices may be the same, but the pie can be bigger. Social Man’s best hope is to work with Economic Man toward the kind of dynamic economy that will make such a happy solution possible.

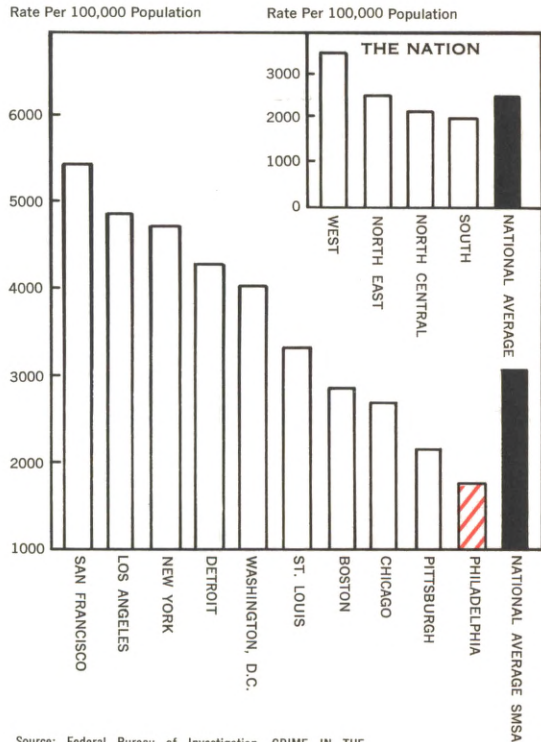
Possibilities of cooperation are greater now that there is common recognition of a pressing need to clean up the environment. The environment is something tangible that Economic Man can understand; and it is free of difficulties which the Puritan Ethic poses for him in accepting such social programs as minimum income maintenance. At the same time, Social Man can find in efforts to improve the environment many opportunities to better the lives of those who are socially deprived. The danger in the environmental issue is that it could divert attention from the needs of people. The hope is that it may provide a common ground for Economic Man and Social Man to come together to work for their mutual interests.

Both have a vital role to play. Social problems cannot be solved without a strong and growing economy, and we cannot prosper economically if we continue to have large parts of the population not sharing in the fruits of production.

# The Geography of Crime\*

by Margaret M. Keeney

CRIME: PHILADELPHIA AND THE NATION



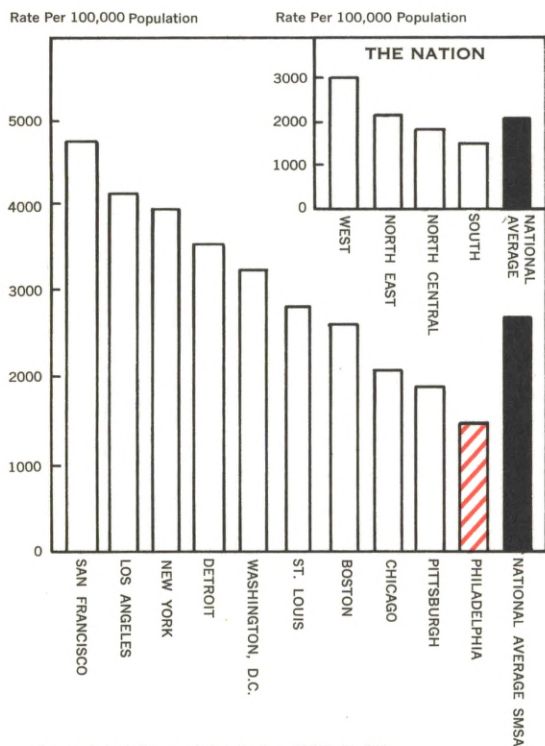
Source: Federal Bureau of Investigation, CRIME IN THE UNITED STATES, Uniform Crime Reports, 1969.

Although reported criminal offenses continued to climb last year, some regions of the country were affected more severely than others. The incidence of reported crime in the Philadelphia region was considerably below the U.S. average and the lowest of the ten largest metropolitan centers in the nation.

\*Crime statistics are collected by the U.S. Federal Bureau of Investigation from local law enforcement agencies. Although precise guidelines are issued to individual agencies, discrepancies in reporting procedures may exist because of factors varying from one community to another. Metropolitan data in this report refer to Standard Metropolitan Statistical Areas. See Federal Bureau of Investigation, *Crime in the United States*, Uniform Crime Reports, 1969.

The majority of all criminal offenses were crimes against property (burglary, larceny of \$50 or more, and auto theft). In 1969, when crime increases hit every major city, Philadelphia maintained a relatively favorable position by recording the lowest rate of property offenses.

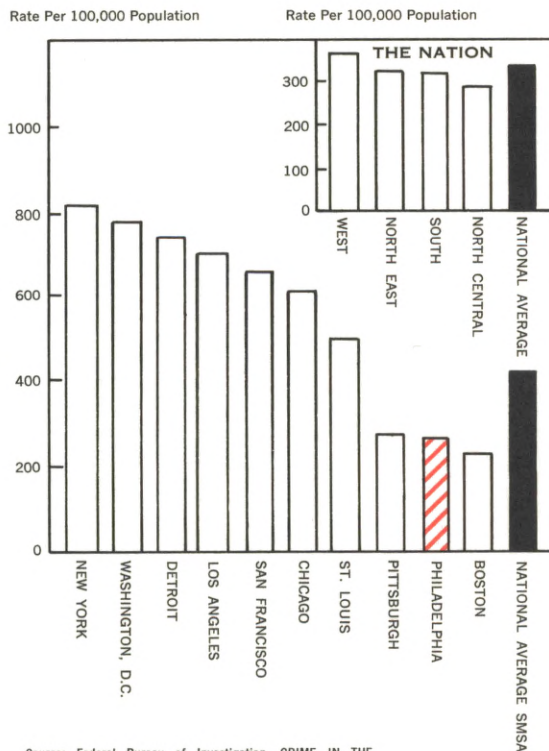
### PROPERTY OFFENSES



Source: Federal Bureau of Investigation, CRIME IN THE UNITED STATES, Uniform Crime Reports, 1969.

Metropolitan areas experiencing the highest incidence of crime against property also recorded the highest rates of violent crimes (murder, forcible rape, robbery, and aggravated assault). Although violent crime increased in all major metropolitan areas in 1969, the rate of violence in the Delaware Valley remained below the national average.

### VIOLENT CRIMES

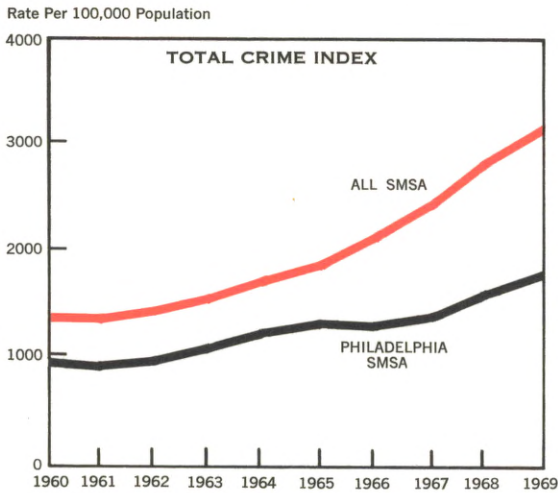


Source: Federal Bureau of Investigation, CRIME IN THE UNITED STATES, Uniform Crime Reports, 1969.



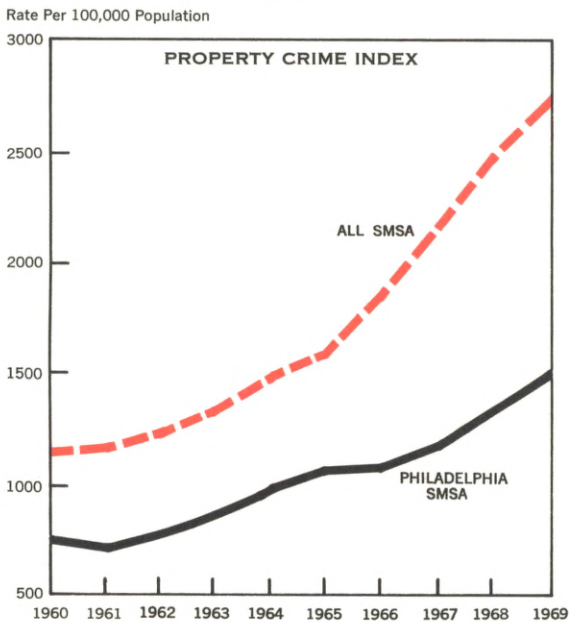


### A DECADE OF CRIME



Source: Federal Bureau of Investigation, CRIME IN THE UNITED STATES, Uniform Crime Reports, 1960 to 1969.

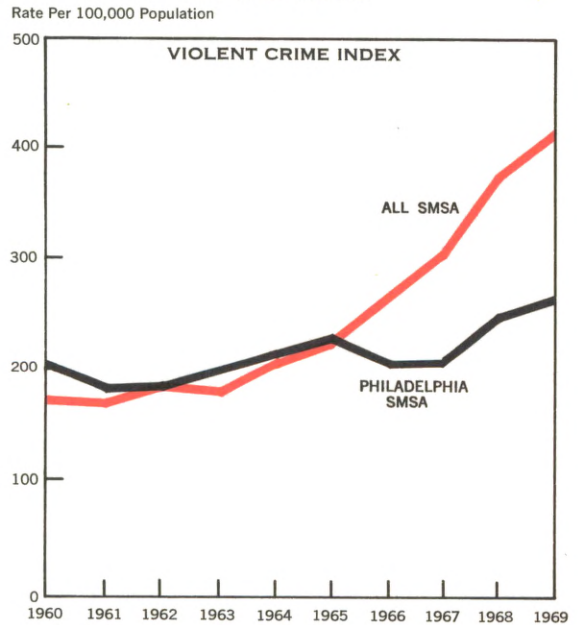
### THE GROWTH OF PROPERTY CRIME IN THE 1960'S



Source: Federal Bureau of Investigation, CRIME IN THE UNITED STATES, Uniform Crime Reports, 1960 to 1969.

The crime rate in Philadelphia has been below the U.S. average over the past decade. The gap between local and national experience began to widen in 1966 when property crime in Philadelphia was substantially below the national average and the region's rate of violent crime actually declined.

### THE GROWTH OF VIOLENT CRIME IN THE 1960'S



Source: Federal Bureau of Investigation, CRIME IN THE UNITED STATES, Uniform Crime Reports, 1960 to 1969.

Despite Philadelphia's relatively good standing among other urban centers, the increase in the absolute level of crime in each of the past ten years results in staggering economic and social costs for the Delaware Valley.

# A Noneconomist's Nonmathematical Guide to Econometric Forecasting

by Ira Kaminow

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In 1938 the famous magazine, *Literary Digest*, went out of business after (and many people believe because) its primitive public opinion poll failed to predict F.D.R.'s victory in the 1936 election. It is fortunate that Harvard University did not suffer a similar fate when its primitive econometric forecasting model (The Harvard Business Barometer) failed to predict the Great Crash of 1929. While the school was saved, the model sunk without a trace. The Barometer, however, turned out to be a prototype of all the big, shiny, computer-run econometric forecasting models that were to follow. These models, like the original Harvard effort, are highly abstract representations of the economy or other social systems that use quantitative techniques and statistical theory to forecast social phenomena. It is a measure of the current esteem for econometric forecasting that the first Nobel Prize in economics went to Jan Tinbergen and Ragnar Frisch, who were among the dozen or so men who laid the foundations of modern econometric analysis in the 1930's.

Today, an ever-growing number of countries, rich and poor, capitalist and socialist, use econometrics to forecast GNP, unemployment, national labor and resource requirements, and so on. In the United States alone, dozens of government agencies, businesses, and universities regularly forecast national economic phenomena with econometric techniques. The techniques are used also by business firms to forecast costs, sales, and prices; by banks to forecast deposits and loan demand; by cities to forecast population shifts and residential patterns; by public utilities to forecast service demand; and by policymakers to forecast the effects of alternative actions.

Many laymen wonder what econometric forecasting is all about. Is it a toy or a valuable

tool? A great breakthrough or the same old predictions printed on new computer paper? There is, of course, no need for all the mystery. The basic principles and problems of econometrics can be explained or at least illustrated in a simple fashion.

### **SPECULATING ABOUT THE FUTURE**

No one knows how man first began to speculate about the future. Somewhere along the way, however, people began to hit upon the idea of searching for regularities in the organization of their environment that could be used to convert present knowledge into predictions of the future. What a remarkable event it must have been when a man first noted that thunder, clouds, and rheumatism pains were generally followed by rain.

Down through the ages, the use of regularities in predicting has become a part of us. We use them unthinkingly to predict how well we'll get along with a new neighbor ("I don't trust people with shifty eyes."); when a spouse will arrive home ("She always gets home late on Wednesdays."); or when the stock market will recover ("The market always rises after the President makes a speech."). We use them more consciously to predict when the earth and moon will be aligned well for lunar landing or when a laboratory animal will push a bar in its cage.

Regularities are used also in nearly all forecasts of business and social phenomenon. Sales rise in the Spring; GNP usually falls after a decline in the money supply; prices go up after a sales tax is imposed.

### **WHAT IS ECONOMETRICS?—A PROVISIONAL ANSWER**

Traditionally, social and business predictions

have tended to be casual, and regularities have not been verified systematically. In fact regularities are not always explicitly stated or recognized by the forecaster. Frequently, forecasters make rapid forecasts involving many complicated relationships. No doubt they use real or imagined regularities subconsciously in much the same way that we can all speak at least passable English without having to consciously make use of all the rules of grammar. Often when the forecaster is consciously aware of using regularities, he states them vaguely. "If the sales tax goes up by 10 per cent, prices will rise by 15 or 20 per cent" is as precise a statement as you can expect from forecasters using traditional techniques.

Econometrics is an attempt to make forecasting techniques more explicit and quantitatively precise. This means that suspected regularities are to be stated as explicitly as possible and subject to systematic tests to see how regular they have actually been. It also means that the regularities are to be stated in quantitative terms. The relation between prices and sales tax might be stated by an econometrician: "On the average, when the sales tax goes up 10 per cent, the consumer price index will go up by 17 per cent. Moreover, there is one chance in three that it will go up by more than 19 per cent or less than 15 per cent and two chances in three that it will increase between 15 and 19 per cent."

More than merely using explicitness and precision, however, econometrics insists upon them, and this can lead to trouble. How, for example, can one explicitly set down the tone of the President's speech or a prospective customer's voice?

A changing world presents another problem. Econometrics has no way of revealing new regularities or changes in old ones until the new

regime has been operative for some period of time. Because the technique relies on a systematic search for the existence of regularities, it can operate effectively only after some experience has been accumulated. In contrast, non-econometric forecasters can use intuition, common sense, or theories to anticipate changes in regularities.

Against these limitations of the explicit approach, econometricians weigh several advantages. First, when an econometrician writes everything down explicitly, he can see more clearly the implications of his words. He will, therefore, less likely say by implication what he would not have said outright. Second, by recording each step, he invites debate and critical comment which permit him to improve the quality of his forecasts. Finally, by writing everything down explicitly, the role of each step in the final forecast becomes more apparent. This allows the forecaster to see how things would have been different if this or that factor were changed.

As it turns out, we need not make a hard choice between the econometric and traditional methods. Econometric techniques can be used for some problems, while we save the more traditional techniques for other problems, or we can use both techniques in tandem. Some policymakers use more than one forecast and then try to reconcile any conflicts among them to arrive at a final forecast.

### **THE SEARCH FOR REGULARITIES**

The search for regularities takes place in the data of the past. Economic or other theory, intuition, and knowledge of social institutions suggest the factors that are likely to be good indicators of the phenomenon that is to be predicted. But only by putting on his work clothes and going into the mines of past data can the

econometrician find out which variables traditionally have been the best indicators. He knows, of course, that there is no guarantee that past regularities will continue to hold in the future. This only means that he must be careful lest he come out of the mines with fool's gold. The econometrician recognizes, however, that past experience is the only experience he has, so there is really nowhere else to look.

### **ESTIMATING INFLUENCES**

Mining the data is a two step process. Both steps are usually carried out simultaneously, but we shall look at them as though they were taken sequentially. The first step is to estimate the past relation between each candidate indicator and the phenomenon we will forecast.

Suppose an econometrician wants to forecast sales of Super Eight Boodle Buggies. The indicators he will look at will no doubt include price; some measure of the level of prosperity, such as GNP; the availability of credit; and so on. To make the game simple, we will assume that he is concerned only with the relation between price and sales. To make the game interesting, we shall watch the econometrician from Mount Olympus where the true relation is known: if nothing else changes, a fifty dollar change in price will lead to a change in sales of 500 buggies.

The econometrician, of course, does not know this. All he can observe is a list of prices and the volume of sales associated with each price. Since factors other than price will influence sales, the true relation between the two will be obscured. On one occasion, sales may have changed (because of factors other than price) with no changes in price. On another, a fifty dollar cut in price might have been followed by an increase in sales of 700 cars, while at some other

time a one-hundred dollar price boost choked off sales by only 100 cars. How does the econometrician use the somewhat haphazard observed relation between price and sales to estimate the true response of sales to price changes? One possibility would be to use an average of all observed responses. Another might be to use the

response midway between the highest and lowest observed responses. Actually, the econometrician will use neither of these estimating rules, but he will use an arithmetic rule that is no more complicated than the two suggested here. A more detailed discussion of the rules econometricians use can be found in the accompanying box.

### MORE ABOUT ECONOMETRIC ESTIMATING TECHNIQUES

Rather than just select an estimating technique at random, econometricians usually establish properties which they consider desirable and then choose a rule which combines these properties in some satisfactory way.

Econometricians recognize that any estimate is due in part to chance, because it depends in part on the particular values that were observed. In terms of the Boodle Buggy problem, the econometrician observed a limited number of combinations of prices and sales. Sales were influenced in part by the price, but also in part by other factors. Had he observed another period with exactly the same prices, sales would have been different. With the same set of prices, but different sales figures, the econometrician's estimate of the influence of price on sales would naturally be different.

If we viewed the world through the econometrician's eyes, we would act as though it were conceptually if not actually possible to observe a large number of periods that were identical with respect to Boodle Buggy prices but differed in all other respects. Each time we would get a different set of sales and a different estimate of the influence of price on sales. In evaluating alternative estimating techniques, econometricians are concerned with the distribution of these various estimates.

The two properties that econometricians most frequently look at are: (1) the average or *expected* value of the estimates; and (2) the sensitivity of the estimates to the particular sample chosen. (An estimation rule which was very sensitive to the particular sample observed would produce widely differing

estimates of the same underlying number.) A technique that gives estimates which tend to average out around the true value is called unbiased; a technique that is relatively insensitive to the particular sample chosen is efficient. Obviously, the most desired estimating techniques are the least biased and most efficient.

Clearly, econometricians cannot observe a large number of successive sets of data. There is no way they can select a large number of twenty-year periods, say, that are identical with respect to the price of Boodle Buggies. At first blush, it would seem that bias and efficiency are not really relevant to econometric problems. This, however, is not so. There is no reason for us to be restricted by physical constraints if our minds can exceed them. Econometricians have devised techniques that *would* yield estimates with the desirable properties if it were possible to obtain a sufficiently large number of estimates. Indeed, it is the very substance of econometric theory to tell us the circumstances under which the desirable properties are available. For example, when some rule is biased or when one rule has the same bias but is more efficient than another.

For forecasting purposes, the prediction is probably the most important characteristic to be calculated, but its usefulness is considerably increased if the user knows the *standard error of the estimate*, which is a measure of the extent to which predictions tend to deviate from the actual values. If observed values tend to be near their estimated expected values, the standard error of the estimate will be low.

## THE CUT

Having estimated the quantitative impact of each candidate indicator, the next step is to cut out all those that have not shown evidence of helping to anticipate the movements in Boodle Buggy sales, or whatever it is the econometrician wants to forecast. To test each potential indicator from this point of view, the econometrician simply makes sample predictions with and without each indicator to see how much each one helps.

First, he uses his estimates to find out what his forecast would have been in each past year. For example, in 1959, the price was \$2,500; GNP was \$484 billion; etc. Based on the estimates of the influence of each of these factors, sales should have been 80,000 units. The next step is to find out what his predictions would have been *without* the indicator that is on the line by simply ignoring its influence. If, on the average, these predictions are significantly better with the indicator than without, the indicator stays; if not, it gets cut. There are, of course, objective measures of whether the indicator adds significantly to the predictions.

## WHY ECONOMETRICIANS DISAGREE

The claim of econometrics is merely that the practitioner is explicit and quantitative. It is objective in no other sense. It eliminates neither error nor controversy. All claims to the contrary by both supporters and opponents are demonstrably false.

The most frequent challenge faced by the econometrician is that he has neglected some crucial point that makes the past regularities he has uncovered irrelevant or potentially irrelevant for the future. There is limitless opportunity for econometricians to overlook important

considerations and, so, limitless opportunity for disagreement and error. It would be impossible for us to look at all the fields on which econometricians do battle. However, a brief glimpse at a few might serve to illustrate the kinds of pitfalls that face the unwary.

**Finding the Form.** One trap whose jaws await the econometrician concerns the form of the relation between two variables. In the Boodle Buggy problem, we let the econometrician know from the outset that the response of the *number* of cars sold to any given change in price was constant. Because he knew this, he had a leg up on the problem—all he had to do was to estimate the constant response. Usually, the econometrician does not know the form of the relation, however, so he must take a shot in the dark. For example, he might guess that the *percentage* response of Boodle Buggy sales to any given percentage change in price is constant. Now, whatever estimating rule he uses will give him some estimate of this supposed constant percentage response of sales to price. Obviously, however, since the econometrician estimated the wrong thing, his estimate cannot possibly be correct. The dangers of an incorrect specification of the form will depend, of course, on how close the imposed form is to the “true” form. A particularly sinister problem arises when the degree of similarity of the two forms changes over time, for then past regularities become inapplicable to the future.

**The Problem with Leaving Things Out.** In looking at the influence of each indicator, the econometrician must not ignore the possible influence of other factors. Otherwise, in his singlemindedness, he might attribute the influence of one factor to another.

We can illustrate this point by going back to the Boodle Buggy problem. Suppose that advertising expenditures influence sales but have not been acknowledged explicitly by the econometrician. If the Boodle Buggy Company usually alters advertising expenditures to partially offset price changes, the econometrician must allow the estimating technique to recognize the link between advertising expenditures and price. If he does not, the estimate of the influence of price on sales will be too low. Whenever price changes, it will appear to have a smaller influence than it actually does, because increased advertising expenditures will tend to offset the price effect. The econometrician's estimate of the influence of price on sales will almost surely be biased downward.

As long as the relation between price and advertising expenditures persists, the quality of predictions will be unimpaired, because changes in price will adequately capture movements in advertising expenditure. It would be a sorry executive who took the estimate of the weak response too literally, however. For then, like the man who wanted to move the sun to the evening because it was already light enough in the day time, he might decide that there is no need to squander all that money on advertising.

The illustration we used here might seem obvious, but an econometrician can never be sure that he has included all important indicators. Indeed, the very similarity in the movements of two variables may cause the econometrician to neglect one of them as an *indicator*, even though they both exert strong influences on the phenomenon he is trying to predict. When two variables move up and down together, the use of both as indicators may be superfluous, and forecasts using both may not be much better than those using only one. In

such a case, the econometrician will have no way of knowing that both help to determine the phenomenon he is trying to predict.

**Structure vs. Reduced Form.** There is one last battleground that should not be left out of our discussion. If an econometrician wants to predict, he must use as indicators variables that are known at the time the predictions are made. In the jargon of econometrics, these are known as the *predetermined* variables. Now sometimes a regularity is uncovered that does not involve any predetermined variables. Imagine, for example, that consumption in any year is related to income in that year. Clearly, this relationship by itself cannot be useful in predicting consumption, because by the time we know income, we also know what consumption was. However, if national income can be shown to depend on some predetermined variable, such as government expenditures, we can use the two relations to predict consumption.

One way would be to: (1) estimate the relationship between government expenditures and income; (2) use this relation to estimate income using known figures on government expenditures; and (3) plug the income figure into an estimated relationship between income and consumption. The estimates of the relations so obtained are called the *structural estimates*, because they are concerned with the system's underlying structure. If we are not interested in the structure, we can squeeze the system into what is known as its *reduced form* simply by estimating the net relation between government expenditures and consumption directly. Implicit in this relationship will, of course, be the two structural relations.

Now, the choice between estimating reduced forms and structures is among the most inter-

esting in econometrics. The structure clearly provides the most information and detail. To know the structure is to know not only the relation between the predetermined variables and the phenomenon to be predicted, but also the "intermediate" steps that connect the two. Among the advantages that can be claimed for this information is the fact that the results of any changes in the intermediate relations can easily be incorporated into the estimates.

Another advantage provided by estimates of the intermediate relations is the opportunity to check these estimates for consistency with any related evidence that has been gathered in other contexts, as well as our own beliefs about what is "reasonable." A reduced form merely indicates the net relationship and suppresses the underlying relations by which the "reasonableness" of the regularity can be judged. To argue that government expenditures influence consumption without reference to, or testing of, the logical links between the two—government spending's influence on income and income's influence on consumption—deprives us of the opportunity to make statements about why or how government expenditures should influence consumption. If a regularity is "unreasonable" or if its "reasonableness" is in doubt, we will have less confidence in its trustworthiness.

The cost of the additional information and detail built into the structural approach is an increased opportunity for error. In our illustration, we allowed government expenditures to influence consumption only through income. Suppose that there was, in fact, another channel through which government expenditures influenced consumption. Perhaps consumption is linked to the interest rates because low interest rates encourage purchases of durable goods, such as cars and houses. Because government ex-

penditures financed through borrowing changes interest rates, there will be another channel through which government expenditures affect consumption. If we neglect this in the structural representation, that representation would be insensitive to a portion of the impulses flowing from government expenditures to consumption. The result very well could be distorted forecasts. Had we used the reduced form procedures, however, our ignorance would have been quite unimportant. The reduced form merely postulates that government expenditures is a good indicator of consumption, but it is silent on the precise nature of the relation between the two. The econometrician's reduced form representation is the same whether there is one or a hundred channels, and the discovery of new channels will not cause him to change it.

#### A QUICK CRITIQUE

Econometrics is a useful forecasting device that will undoubtedly become more popular and useful in the future. Indeed, in many cases, it may eventually become the major forecasting tool, and rightly so. But it is easy to overstate the contribution of econometrics to forecasting. It leaves most of the major problem of social and business forecasting unsolved. Recorded experience is very sparse and not always accurate. This obviously makes the search for regularities more difficult. Moreover, social phenomenon are extremely complex and, so, impossible to forecast without error. Nothing about current econometric techniques can change this. Econometrics is, as we said in the beginning, a new approach to what is essentially a very old forecasting method.

In fact it may be that the greatest contribution of econometrics will be to point out very clearly and obviously the difficulties inherent in



social and business forecasting. The difficulties we looked at in the last section are by no means unique to econometrics. They are, however, made much more obvious by the rigor of the

econometric approach. In the end econometrics may teach us that we have been fooling ourselves all along, by overestimating our capacity to foresee the future by looking to past regularities.

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## FEDERAL RESERVE BANK OF PHILADELPHIA

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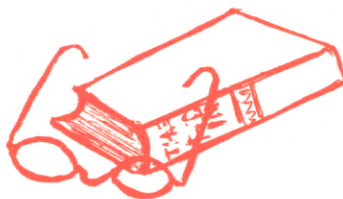
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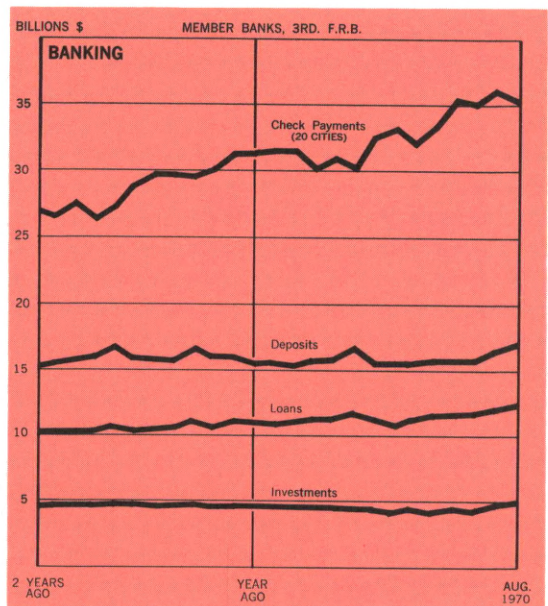
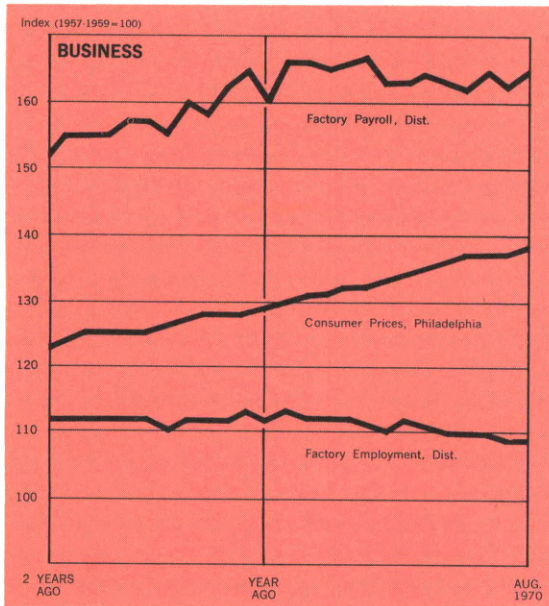
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# FOR THE RECORD...



SUMMARY	Third Federal Reserve District			United States			LOCAL CHANGES								
	Per cent change			Per cent change			Manufacturing		Banking		Standard Metropolitan Statistical Areas*				
	August 1970 from		8 mos. 1970 from	August 1970 from		8 mos. 1970 from	Employment	Payrolls	Check Payments**	Total Deposits***	Per cent change August 1970 from				
	mo. ago	year ago	year ago	mo. ago	year ago	year ago	mo. ago	year ago	mo. ago	year ago	mo. ago	year ago			
<b>MANUFACTURING</b>															
Production .....				+ 3	- 5	- 2	Wilmington ..	- 4	- 7	- 5	- 2	- 5	+ 7	- 4	- 4
Electric power consumed	0	0	+ 2	Atlantic City ..						+ 5	+17	+ 4	+18		
Man-hours, total*	+ 1	- 6	- 3	Trenton .....	0	- 4	+ 6	+ 6	+ 5	+20	- 2	+23			
Employment, total	0	- 4	+ 2	Altoona .....	0	- 1	+ 6	+ 3	- 5	+10	+ 2	+ 7			
Wage income*	+ 2	- 1	+ 2	Harrisburg ...	- 1	- 2	- 1	+ 1	- 1	+11	+ 1	+45			
<b>CONSTRUCTION**</b>	+26	+23	+26	Johnstown ...	- 2	- 6	+ 4	- 3	-10	+ 4	+ 2	+11			
COAL PRODUCTION	+48	+10	- 2	Lancaster ....	0	- 2	+ 1	+ 3	- 4	+16	+ 3	- 4			
				Lehigh Valley.	+ 1	- 2	+ 2	+ 2	+ 1	0	+ 1	+ 9			
<b>BANKING</b>				Philadelphia ..	0	- 6	+ 2	- 2	- 2	+13	+ 2	+ 7			
(All member banks)				Reading .....	+ 1	- 6	- 2	- 4	0	+13	+ 1	+ 9			
Deposits .....	+ 2	+ 6	- 1	Scranton .....	+ 3	- 9	+ 2	- 6	- 2	+ 4	0	+10			
Loans .....	+ 1	+ 9	+ 7	Wilkes-Barre ..	0	- 6	0	- 1	- 4	+ 1	+ 2	+ 3			
Investments .....	+ 2	- 1	- 7	York .....	0	- 2	+ 2	0	- 4	+ 6	+ 1	- 5			
U.S. Govt. securities	+ 2	- 6	-11												
Other .....	+ 2	+ 3	- 3												
Check payments***	- 2†	+12†	+13†												
<b>PRICES</b>															
Wholesale .....															
Consumer .....	0‡	+ 6‡	+ 6‡												

\*Production workers only  
 \*\*Value of contracts  
 \*\*\*Adjusted for seasonal variation

†15 SMSA's  
 ‡Philadelphia

\*Not restricted to corporate limits of cities but covers areas of one or more counties.  
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 \*\*\*Member banks only. Last Wednesday of the month.