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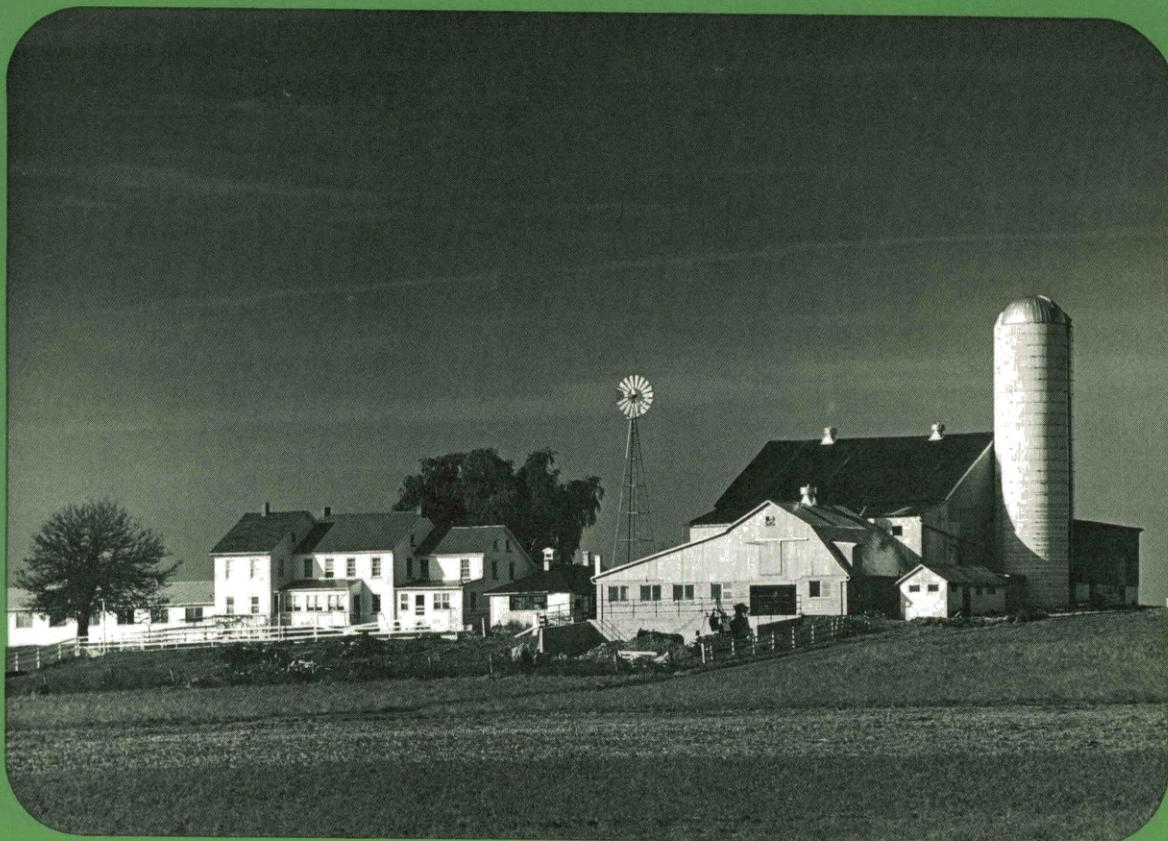
Police and Productivity: Can the Invisible Hand of Competition Extend the Long Arm of the Law?

The Boom in Business Loans: Bargain Loan Rates and an Expanding Economy

Changing Times on Pennsylvania Farms

FEDERAL RESERVE BANK of PHILADELPHIA

business review



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On our cover: This handsome farm is typical of the many which dot historic Lancaster County, the leading agricultural area in Pennsylvania. (Photo courtesy of the Pennsylvania Dutch Tourist Bureau, Lancaster, Pa.)

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Police and Productivity: Can the Invisible Hand Of Competition Extend The Long Arm of The Law?

By Stephen L. Mehay

Police protection, like almost everything else, costs more nowadays. Most municipal police departments have beefed up their forces and their budgets.¹ As a result, bigger police budgets are causing many citizens to wonder how well their tax money for crime prevention is being spent. Now, more than ever, big city mayors and councilmen are exploring ways of getting more and better police services per tax dollar.

A major roadblock to improving police services is the fact that most of these services are not priced and sold to consumers. This nonmarket environment increases the difficulty of efficiently distributing tax dollars

among numerous uses. For example, deciding whether to add more manpower or more communications equipment to radio patrol, or whether to strengthen the robbery detail rather than the vice squad, will always be difficult. But the marketplace provides valuable guidelines to help police administrators make such tough decisions. When police services can be provided either through the market or through a simulated market situation, greater efficiency can be expected.

POLICE AND EFFICIENCY

Concern over police efficiency is probably as great at City Hall as it is with the man in the street. Local tax bases have shrunk in recent years at the same time that population shifts in our urban centers have caused demands for municipal services to skyrocket. To make matters worse, urban residents have been increasingly reluctant to support pro-

¹This is true even of cities with declining populations. In Philadelphia, for example, major crimes in the past decade rose nearly 60 percent and expenditures for police protection rose by 177 percent, while the Quaker City's population declined.

posed tax rate boosts. Although Federal revenue sharing has recently begun to brighten the urban financial picture somewhat, money pressures persist. Local government officials have been forced to reexamine the way resources are allocated in the hope of finding ways to use those already at hand more effectively.

A common misconception is that greater efficiency in government means lower operating costs. But economic efficiency is much more than that. It involves supplying those services which consumers desire the most, and in the quantities they want, with the minimum use of society's scarce resources. This concept is served fairly well when goods and services are produced and sold in the marketplace. Consumers' spending patterns reveal which goods they want and in what quantities, and competition among firms insures that only efficient producers survive to supply the market.

When government provides services, profit incentives and external pressure from competitors are absent. The real preferences of the consumers of those services—taxpayers—will only be evident at the ballot box during elections. The fact that elections are infrequent and many issues may have to be decided with a single vote makes these preferences hard to see clearly. As a result, police departments, unlike private firms, are not governed by explicit supply-and-demand forces, and the incentives to be efficient are either weak or absent altogether.

Two complementary strategies for helping those entrusted with the public purse to make economically sound choices are the administrative approach and the market approach. Which of the two strategies should be used depends on the strength of demand signals for particular services.

Almost all police services yield benefits to particular individuals or firms and could potentially be sold on the market. And for some services benefits can be traced directly to the individual recipients. For these ser-

vices demand signals will be strong and a direct *market* solution to the allocation problem is appropriate.

But other police services, especially patrol, investigation, and apprehension (that is, crime prevention services), yield further benefits to the community as a whole in addition to those received by individuals. These services deter crime but we can't predict who will be saved from becoming victims. Thus, the market cannot be depended upon to reveal consumer demands for these services. In these cases, an internal, *administrative* technique can be used to simulate the market.

THE ADMINISTRATIVE APPROACH: CHOICE WITHOUT MARKETS

The administrative approach tries to identify those police services which yield benefits to the entire community and to measure the size of those benefits (that is, demand). When dollar values are attached to the benefits they can be weighed against the cost of providing the services to find where the greatest public good can be purchased with each dollar of expenditure. In this way the police can accomplish society's objectives without wasting scarce resources.

Why Police? Although not all police programs are designed to fight crime, most observers agree that the major function of the police is to protect citizens from criminal activity. And most citizens would further agree that the lower the crime rate the greater protection afforded the community. Thus, the benefits of crime-detering services are reflected in part by lower crime rates.

But police must always grapple with the problem of choosing which types of crime to attack on pinchpenny budgets. Because police officers can't be everywhere, they must assign priorities to the various classes of crime—crimes against property, crimes against persons, vice, juvenile violations, riots, and organized crime—and decide which to enforce most vigorously. For ex-

ample, if they crackdown on car theft, then they must pull men from other crime details such as burglary and robbery. The community may pay for decreased car thefts with increased robberies and burglaries.

Would such shifts in police activity benefit the community? The answer depends on how people evaluate the seriousness of different crimes. One way to determine the seriousness of certain crimes is to measure the harm and loss associated with each—that is, the cost society bears.

Suppose the average robbery involves \$600 in money stolen,² medical expenses, and wages lost because of injuries. Suppose that the average auto theft involves only \$300 in damages to the automobile plus the value of the lost vehicle's services. Then, each robbery could be weighted twice as heavily as each auto theft. In trying to reduce the cost of crime (crime rates weighted by average losses per crime) instead of the crime rate, the police will be motivated to concentrate on reducing robberies rather than auto thefts. In this way, the community comes out ahead because for every crime prevented, more harm will be forestalled.

Of course, crime imposes costs far beyond those felt just by victims. The rest of society bears costs in the form of supporting a criminal justice system, making expenditures on insurance or protective devices, and altering behavior to avoid high crime areas—to name just a few. Many of these “social costs” are difficult to quantify with any precision but they are nevertheless real (see Box).

² Technically, pure monetary transfers from one person to another don't cost society because there is no reduction in wealth or income. However, the thief who performs the transfer invests his capital and labor in crime rather than in legitimate activities and this investment is wasted from society's point of view. If it is assumed that the amount transferred merely compensates him for his investment, then that full amount can be chalked up as a social cost.

Despite measurement problems, society is better off if police are guided by a goal of reducing the cost of crime, rather than cutting crime rates. This is true because weighting crimes according to a measure of seriousness helps to approximate the collective value that taxpayers place on prevented crimes. The social cost of a crime indicates the harmful impact of that crime on the community. Consequently, it also indicates the maximum amount the community would pay to avoid that crime.

Balancing Act Among Programs. Armed with the objective of reducing the social cost of crime, the administrative approach can measure the probable benefits of crime-related programs such as patrol and detectives. These community-wide benefits can then be balanced against the costs of each program. Normally, what is most important is comparing the benefits and costs of increasing or decreasing the size of various programs rather than the benefits and costs of the whole program. Most resource-allocation decisions boil down to “marginal choices”—between “a little bit more of this” and “a little bit less of that.” An evaluation of the benefits of increasing (or decreasing) a program determines whether the change justifies the cost of implementing it.

For example, a police department may want to evaluate the benefits of an additional officer on a certain beat. First, enough time would be allotted to pass so that both the residents and the criminals could become aware of the added police protection. Then, the area's crime rate would be compared with a “base” crime rate.³ Differences between the actual and base crime rate are the

³ Either the predicted crime rate based on the historical trend of crime for the experimental area or the rate experienced in a different section of the city (with a similar physical and demographic makeup) could be used to establish the “base” crime rate.

SOCIAL COST OF CRIME

Crime imposes costs far beyond just those felt by victims. In principle, crime wastes scarce resources which have productive uses elsewhere. As a result, real output of goods and services is lower than it could be. The total "social cost" per crime includes the use of resources by criminals to carry out crime and by society to prevent it, or to deal with crimes once they have been committed. From society's viewpoint, criminals could be employed in productive legal jobs, and resources used by the police and the rest of the criminal justice system (prosecutors, courts, jails, rehabilitation agencies) could be funneled into other private or public endeavors. In addition, expenditures by private individuals and firms on protection services and devices have other desirable uses.

The President's Crime Commission estimated that in 1965 crimes against persons resulted in economic losses of \$815 million in the form of lost earnings and medical expenses; crimes against property involved transfers and losses of nearly \$4 billion; other crimes (tax fraud, driving under the influence of alcohol) slightly over \$2 billion; and illegal goods and services (drugs, gambling, prostitution) a little over \$8 billion. Public expenditures by law enforcement agencies totaled over \$4 billion, and private protection expenditures were estimated to be over \$1 billion. The total of these admittedly rough, but very conservative, estimates of the cost of crime in the U. S. in 1965 neared \$21 billion, about 3 percent of Gross National Product in 1965.* Recent, but rougher, estimates place the direct and indirect cost of crime at \$45 billion in 1968-69, nearly 5 percent of the average GNP for those years.**

In practice, measuring the real costs above and beyond the monetary value of damages or losses is no easy task. It is as hard to attach money values to the physical pain and mental suffering of violent crime victims as it has been for traffic accident victims. And even when a price tag is affixed to lost productive services of individuals killed or injured, the real losses of family and friends are hard to estimate. It is also difficult to measure the altered behavior of individuals who, for example, avoid living, shopping, and traveling in certain areas of the city for fear of such attacks. Thus, measurement of social costs frequently omits some of the more important aspects of the costs of crime.

* President's Commission on Law Enforcement and Administration of Justice, *Task Force Report: Crime and Its Impact—An Assessment* (Washington: Government Printing Office, 1967).

** Irving Slott and William Sprecher, "Cost Effectiveness and Criminal Justice." Paper presented to ASME Winter Annual Meetings, Washington, D. C., 1971.

number of crime preventions which can reasonably be attributed to an additional officer.

Suppose that the extra officer prevents 10 robberies and 10 burglaries a year. If the average loss (with all social costs included) from robbery is \$600 and from burglary is \$500, then the annual *measurable* benefit of the officer is \$11,000. This figure can be compared with the annual dollar cost of the additional officer, say \$10,000. Using these figures, the net benefit of that officer would be \$1,000 and the police administrator with a fixed budget should add officers to that particular beat provided that (1) the net benefit is greater than zero and (2) it exceeds the net benefit of the officer in another area of the city or in a competing program, such as detectives. If, however, the net benefits from deploying another officer in the detective bureau outweigh those from deploying him in the patrol bureau, then it would pay to add a new officer there or shift an existing officer from patrol to detectives. In general, an additional dollar should be added to each police program until the *extra* benefits in all programs are nearly equal.

Devoting more money to one program inevitably leaves less for the others. The maximum social benefit rule would help police resolve this problem when they must choose which programs will receive funds. There are three major trade-offs which must be made.⁴ First is the decision about which of the various categories of crime to attack. Following the rule, police will give priority to those types of crime that are most costly to society.

Second is the equally thorny trade-off between capital and labor. In place of profits which serve as guidelines to private firms in choosing the "correct" combination of capital and labor, the police can use social benefits. Hence, decisions to add more patrolmen versus more communications equipment in patrol activities, or to add more detectives versus more laboratory equipment in the detective bureau will be facilitated and, hopefully, improved.

The third important trade-off is between crime-related and noncrime-related programs. The police perform many functions such as traffic regulation and community relations which do not contribute directly to crime deterrence. Nevertheless, these programs compete for funds with crime prevention efforts. By computing the social benefits of the noncrime programs and comparing them with crime prevention programs, the decision to expand one at the expense of the other can be made, even though they serve different objectives.

Measurement Problems. If it could be fully implemented, the administrative approach would help improve overall efficiency in the police department. Unfortunately, measurement difficulties may complicate attempts to evaluate the true social benefits of police actions and may block full implementation.

For one thing, if a patrolman is added in beat A, crime may drop there but soar in neighboring beat B. If this happens, the extra man will not have reduced crime but merely "chased" it to a different location. Furthermore, another patrolman might *actually increase* reported crime. This could happen if that officer discovers more crimes or if citizens report crimes that otherwise would have gone unreported. The fact that most types of crimes are underreported (see Box) makes it difficult to determine the true crime rate and to measure changes in it because of police actions. Finally, measuring

⁴ A program budget classifies programs according to major objectives and illuminates the many choices confronting police administrators. The City of Philadelphia *Mayor's Operating Budget and Programs, Fiscal 1973* is a good example of one possible classification of police programs.

CRIME AND ARREST STATISTICS

If police effectiveness in maintaining safe streets is to be accurately assessed, reliable data on the safeness of the streets is essential. Unfortunately, data on many aspects of crime are either unavailable or inaccurate.

Crime Rate. The primary indicator of the extent of crime in the U. S. is the FBI's Crime Index published in the annual Uniform Crime Reports. The index includes seven major offenses—criminal homicide, forcible rape, robbery, aggravated assault, burglary, larceny (over \$50), and auto theft. Since the data are collected from local police departments only offenses reported to the police are included. The seven crimes were chosen because of their seriousness and because they are the offenses most likely to be reported to the police. The crime rate is the number of reported offenses per 100,000 population, and thus standardizes the Crime Index by population size. The crime rate is a rough measure of an individual's chances of becoming a victim of crime and is often called the victimization rate.

Widespread use of the index testifies to the need for indicators of the extent of crime. However, the serious weaknesses of the FBI's reported crime statistics are often overlooked. For one thing, it is hazardous to use the data to compare crime experiences across states or cities. Definitions of each crime vary among states, and the classification of crimes by local police within each state is not as uniform as it might appear. Except for California, no states have crime statistics agencies which collect data on a uniform basis. Also, the crime reporting policies and procedures vary among local police departments, again affecting the collection of crime data. It has been observed that those cities with better organized and more efficient departments report more crime; and when several cities instituted central reporting systems, their crime rates rose.

There is the further problem that even major felonies are not fully reported by victims and witnesses. The President's Crime Commission found that nationwide the actual crime rate was nearly twice the FBI reported rate for index crimes. It is fairly certain that almost all crimes, except perhaps auto theft, are underreported. Because of underreporting the *reported* crime rate does not mirror the *actual* crime rate, and the differences vary between geographical area and over time.

Another frequent objection to the index is that it excludes serious crimes such as embezzlement, narcotics violations and kidnapping and includes "not-so-serious" crimes such as auto theft and larceny. Critics argue that auto theft and larceny (over \$50) impart an upward bias to the Crime Index since these crimes automatically rise with income growth and inflation even though the propensity to commit these crimes may remain unchanged. They feel that the index creates misleading impressions of the rise in crime over time. To correct this they suggest that perhaps auto theft should be dropped from the index and the value of larcenies included should be increased over time with increases in the general price level.

Arrest (Clearance) Rate. The arrest rates defined as the ratio of arrests for each type of crime to the number of those offenses, roughly approximates the

probability of arrest for each type of offense. From the viewpoint of the police, a crime is “cleared” (or solved) when an arrest is made, thus the arrest rate is often called the clearance rate.

Arrest rates rather than crime rates are often suggested as alternative indicators of the effects of crime prevention programs. While arrest rates may adequately measure the effectiveness of police officers on any assigned task, they are unreliable guides to the social worth of that task. Arrest rates reveal little about the safeness of the city’s streets, and taxpayers are more concerned with personal safety than with the ability of the police to increase arrest rates. Furthermore, crimes are not always fully “cleared” when an arrest is made. Usually less than half of all persons arrested are prosecuted and an even smaller percentage are convicted.

Thus, the effects of police crime-prevention programs are currently measured by inadequate yardsticks. These problems with the basic data further frustrate attempts to evaluate systematically outcomes and social benefits of police programs.

the full social cost of crime is difficult. Many real costs associated with crime cannot be measured and many cities don’t even keep accurate data on those costs which are the *easiest* to measure.

Recap. Measurement problems and the often high cost of developing needed information are major stumbling blocks in the way of adopting administrative techniques to improve police efficiency.⁵ But even if no serious obstacles blocked the path of the administrative approach, it is unlikely that current police decision-making techniques would be completely replaced. The purpose of the administrative approach is more modest: to sharpen the judgment of policy-makers by supplying information about the economic effects of the many choices they face. Thus, other methods are needed to supplement the administrative approach.

⁵ Also, considerations other than efficiency are often important to the final decision. For example, some police programs probably help the poor more than the rich. Thus, on equity grounds, it may be desirable to continue these programs, regardless of efficiency considerations.

A MARKET FOR POLICE SERVICES?

Instead of trying to use imperfect techniques which at best only simulate the forces of supply and demand, it might be better to let the market decide what and how much to produce.

The market-oriented approach works in one of two ways. Some protection services can be provided by the police and sold directly to the recipients. Other services might be produced by private firms, thereby removing production decisions from the political arena altogether. For either approach to work, the beneficiaries of the services must be identified and those not wanting to pay must be excluded.

Private Police Firms. Private firms cannot always produce services cheaper than the government. Some private firms are just as inefficient as government is often alleged to be. However, if such firms are not protected monopolies, they will tend to lose profits and, eventually, go out of business. When services are produced in a reasonably competitive atmosphere the incentives for efficient operation are in the right direction.

But if City Hall wishes to retain some control over the production decision, the service could be contracted out to private suppliers through open, competitive bidding. In this way, government decides how much to produce, but competitive producers supply it (see Box).

Fortunately, private suppliers already exist for many police services.⁶ Services of expensive chemical laboratories maintained by most large cities might be obtainable from existing private research facilities or nearby colleges. The training of police officers could be undertaken by private schools with tuition paid by the trainees or subsidized by the city. Most research and planning, maintenance services, and follow-up investigation of property losses could also be farmed out to private suppliers.

Pricing Police Services. Some services which cannot be provided feasibly by private firms can still be sold to consumers—for example, many special protection services and various police reports. User charges for a service improve efficiency by yielding information on the demand for it.⁷ If buyers are unwilling to pay enough to cover the extra cost of the service, then the police are overproducing and should cut back. User charges not only provide useful demand information, they also ration output and force those who benefit most from the services to pay for them. Last, but not least, user charges provide much-needed revenue for strained municipal coffers.

User charges pan out only when police services have easily identifiable recipients.

Most patrol, detection, and apprehension services don't have readily identifiable beneficiaries who can be charged. But other routine police services can be priced. In fact, some cities already charge for copies of crime and traffic accident reports and of fingerprints, for extra police services at sporting and entertainment events, and for towing automobiles. Police services which are not currently priced but which could be offered at fees to cover operating costs are accident investigation services, special parking and crowd control, extra patrols for businesses and residences, police escorts, and searches for lost property, especially stolen automobiles.⁸

A COMBINED APPROACH

If police service delivery can be made more efficient, the increasingly scarce resources available to city governments can be stretched to provide more and better public services. Because police services are provided by government, useful signals about consumer demand are often not received. Consequently, the incentives to channel police programs into efficient uses are weak or entirely absent or, worse yet, often misdirected.⁹ The administrative and market approaches try, in different ways, to provide the missing incentives. If police services can be sold in the market or, better yet, produced by private suppliers, the incentive structure will resemble that faced by profit-seeking firms. At the very least, demand signals will be stronger and will provide police officials with better informa-

⁶ The number of private guards and police in the United States has grown rapidly in the last two decades and now roughly equals the number of sworn policemen (about 300,000).

⁷ A discussion of the benefits of employing user charges for a variety of other public services can be found in S. J. Mushkin, ed., *Public Prices for Public Products* (Washington: The Urban Institute, 1972).

⁸ Forcing the owner to bear the cost of recovering his stolen automobile (either directly or through his insurance company) may "teach" him not to leave his car door unlocked and the keys in the ignition.

⁹ For example, if traffic officers are guided by a quota system for traffic tickets, they may patrol in locations and employ methods which produce the most citations, not the fewest accidents.

MARKET ARRANGEMENTS FOR POLICE SERVICES

Although most cities have had limited experiences with market arrangements for law enforcement services, there's scattered evidence of the workability of this approach. Residents of neighborhoods within some big cities and of some suburbs have collectively hired private firms to provide basic patrol services to supplement those received from the city. This approach works in the case of patrolling a small geographical area because the patrol car provides protection to residents of that area rather than of the entire city. Thus, although it might be difficult to identify the individuals who benefit from a prevented crime, it's possible to identify subgroups of beneficiaries who would be willing to pay for such basic services as patrol.

This notion forms the basis for another successful experiment in marketing police services—the Lakewood Plan in California. This is a plan, named after a city, whereby the Los Angeles County Sheriff's Department provides law enforcement services on a fee basis to 30 of the county's 77 cities. (The plan is also in effect in several other populous California counties.) Services sold to the contract cities include basic preventive patrol, traffic patrol, accident investigation, and safety officers. The contract city can purchase whatever amount of service it desires, above a certain minimum, and it pays accordingly. For example, the basic unit of patrol service is a patrol car on 24-hour duty seven days a week, divided into two eight-hour shifts with two men per car and one eight-hour shift with one man per car. The contract city can purchase any multiple or fraction of this basic unit. The city is charged on a per car basis which is intended to cover the marginal cost of providing patrol service to the contract cities (the sheriff also provides patrol to the unincorporated areas of the county).

Although the Lakewood Plan involves a higher level of government providing police services to a lower level of government, the plan has important lessons for advocates of the market approach. First of all, it shows that it's not particularly difficult (that is, costly) to establish and administer a market-type arrangement in police services. Second, it demonstrates once again that even crime prevention services such as patrol can be sold on a fee basis. Finally, although the sheriff's department neither seeks nor earns profits from the sale of services, presumably the charges levied cover the cost of providing the service. And, since the sheriff faces some competition, he has some incentive to keep costs as low as possible. Where does the competition come from? From the contract city itself which, if dissatisfied with the services received from the the sheriff, has the option of providing its own police services.

At the very least the Lakewood Plan demonstrates that competition between two police forces in one area is workable. Buying services from private firms is not very different from buying from a higher level of government.

tion regarding what services taxpayers most desire and in what quantities.

If, however, services cannot be sold in the private market, the administrative approach must be relied on to provide information on the value consumers place on various police services. This approach imi-

tates the market and spurs internal incentives to police administrators to be efficient. A rational combination of the two approaches may squeeze more crime prevention from strained police budgets and help stem the serious and growing problem of urban crime. ■

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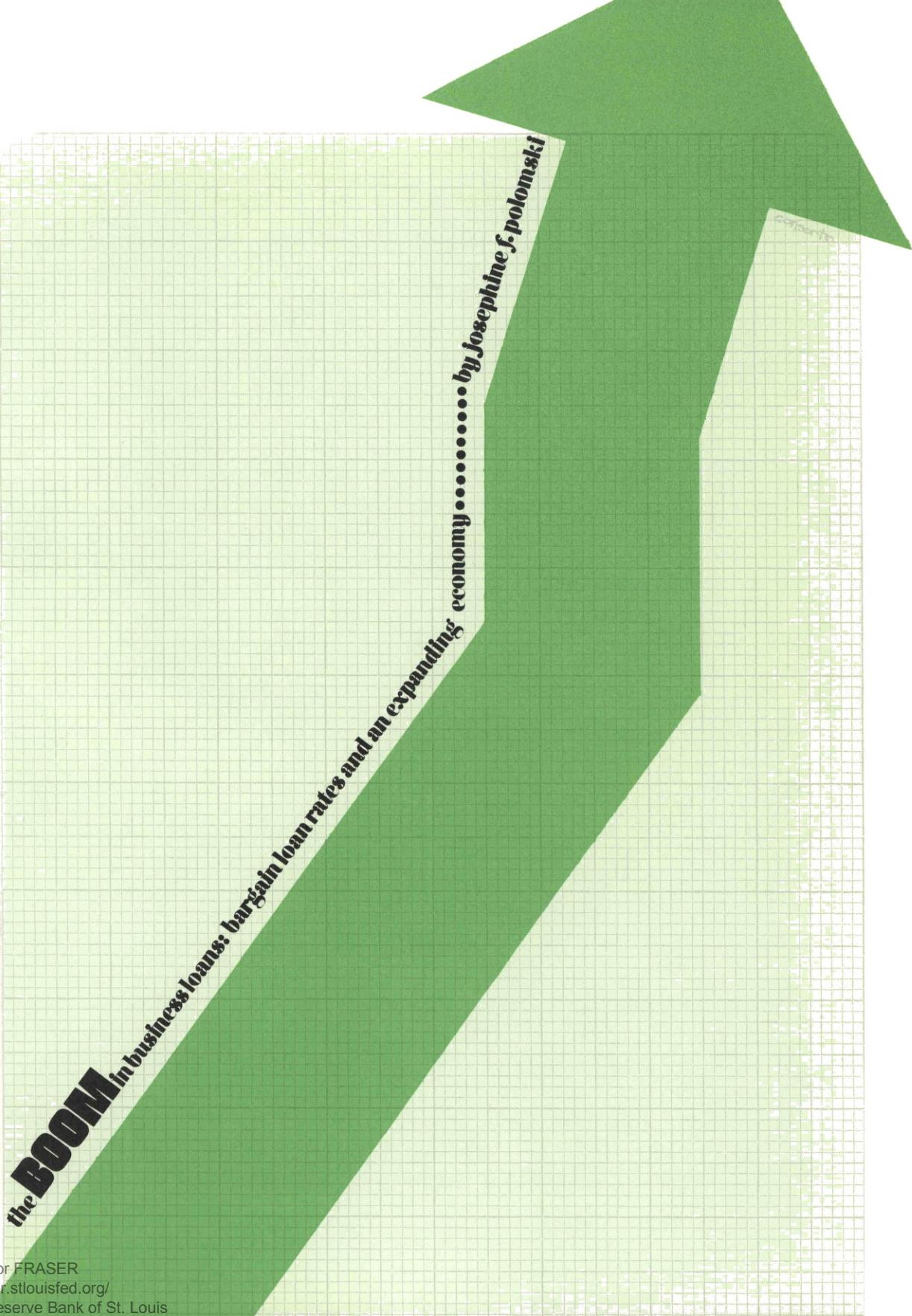
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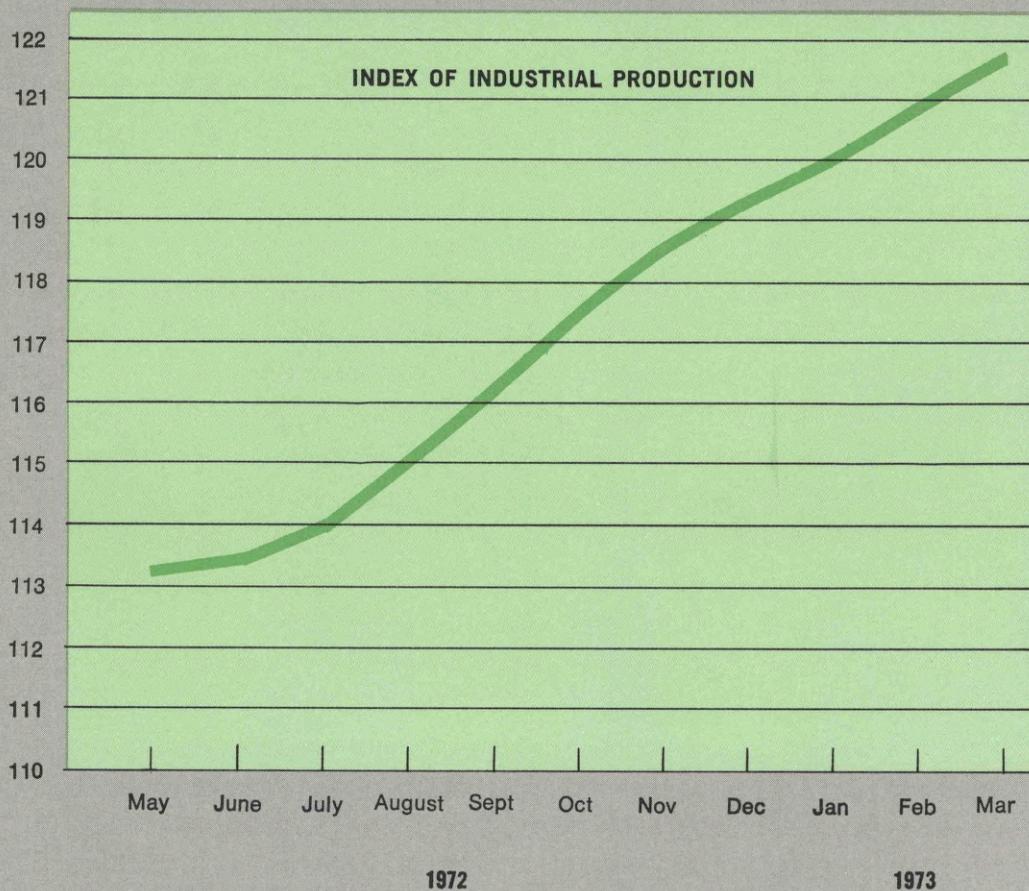


the BOOM in business loans: bargain loan rates and an expanding economy.....by Josephine J. Polomski

CHART 1

THE CONTINUING BOOM IN ECONOMIC ACTIVITY . . .

Index, 1967 = 100

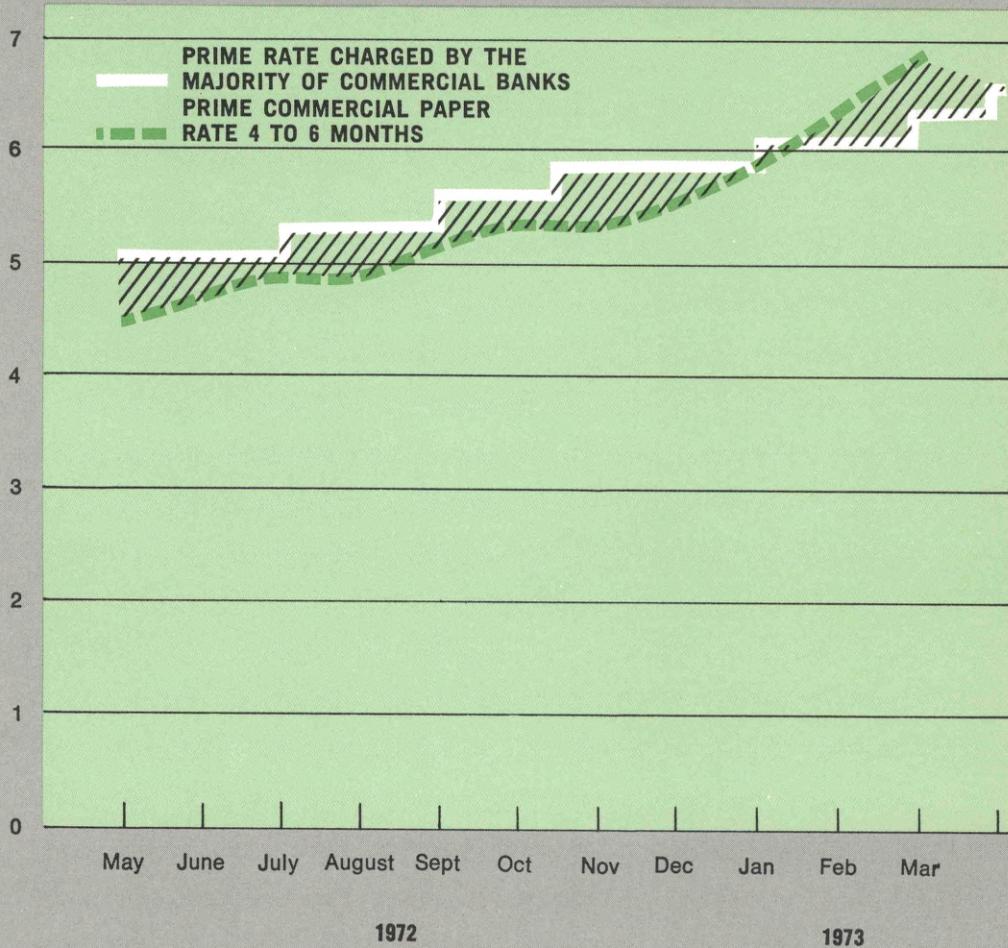


Source: *Business Conditions Digest*

CHART 2

COMBINED WITH BARGAIN RATES ON BANK LOANS COMPARED TO OTHER BORROWING COSTS . . .

Percent Per Annum

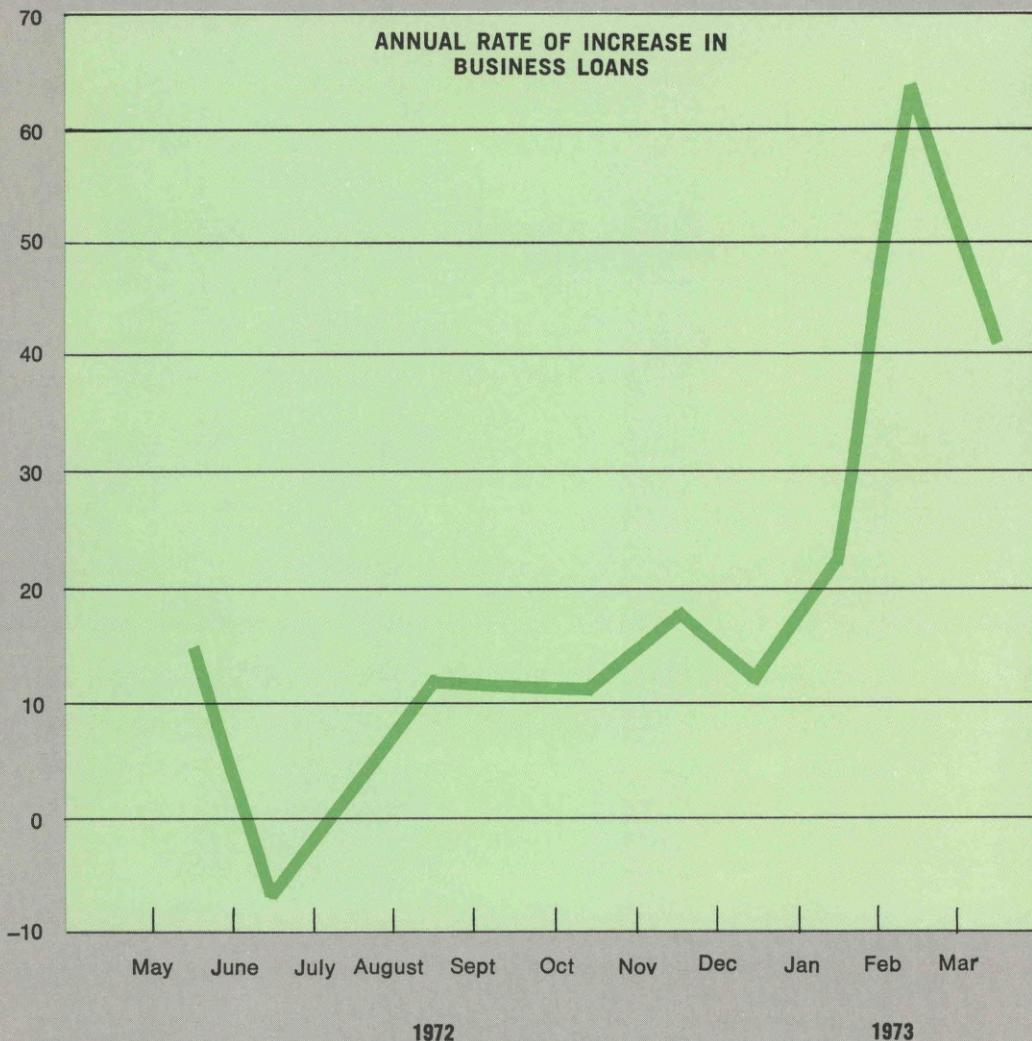


Source: *Federal Reserve Bulletin*

CHART 3

HAS BEEN REFLECTED IN A SHARP INCREASE IN THE RATE OF BANK LOANS TO BUSINESSES . . .

Percent Change

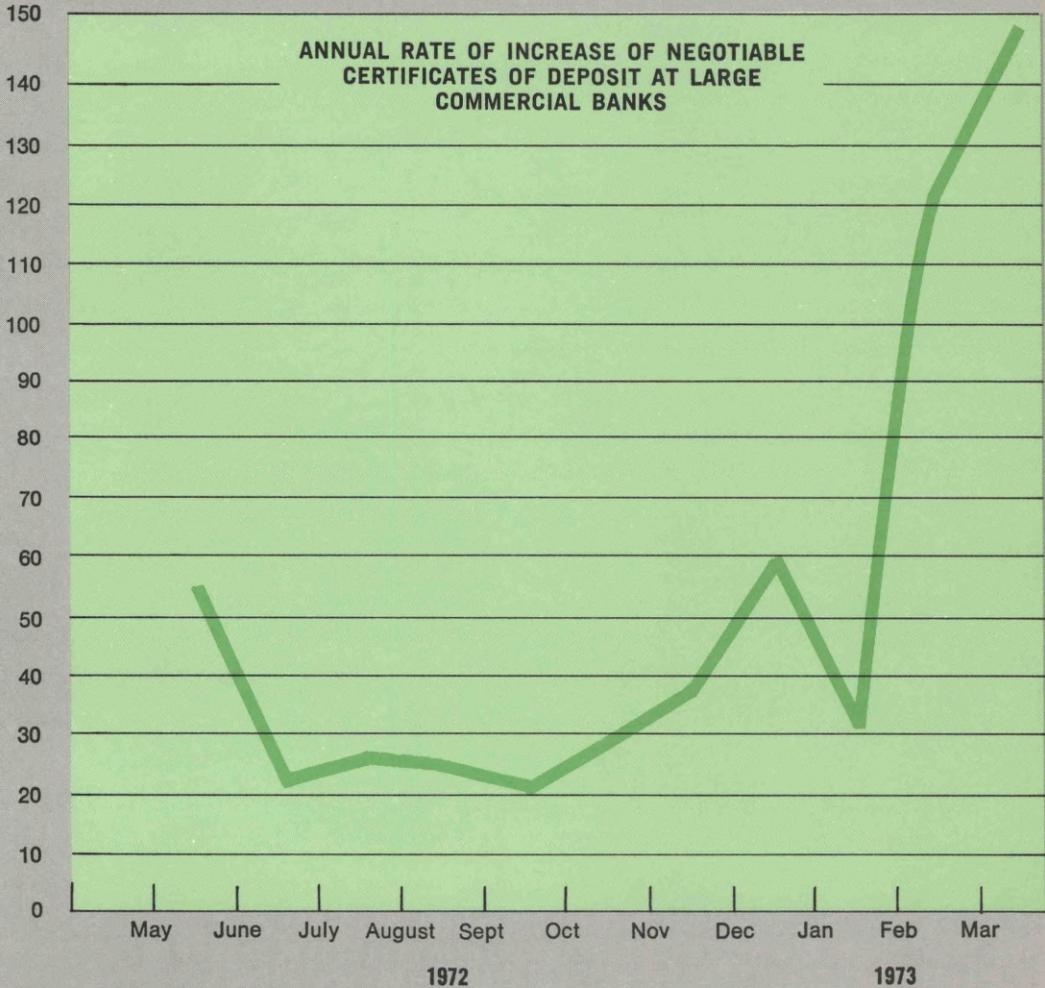


Source: U. S. Financial Data, Federal Reserve Bank of St. Louis

CHART 4

WHICH IN TURN HAS PROMPTED BANKS TO BOOST THEIR OFFERINGS OF LARGE CDs TO ACQUIRE FUNDS FOR LENDING

Percent Change



Source: *Federal Reserve Bulletin*

Changing Times on Pennsylvania Farms

*By Evan B. Alderfer**

Gone are the days of the self-sufficient farmer. Today Pennsylvania has 70 percent fewer farms, 40 percent fewer farm workers, and only about half as many acres under cultivation as at the peak around the turn of the century. However, total farm output is greater than ever. So is productivity per worker and productivity per acre. Higher production and higher productivity have been achieved through advances in biology, chemistry, mechanization, and management. Whether it's milking cows, fattening cattle, growing mushrooms or curing tobacco, technology has touched every nook and cranny of farming.

Farms in the Keystone State continue to dwindle in number, partly because of in-

creasing mechanization and specialization, partly because of the insatiable nonagricultural (commercial, industrial, residential) demands for land. But the *size* of the farms and their capital investment are on the increase. Pennsylvania's farmers are more sophisticated, more efficient, and more eager than ever to turn new techniques and developments to their advantage.

OVERVIEW: SPECIALIZATION SPELLS SUCCESS

Pennsylvania agriculture is a billion dollar industry as measured by gross sales (see Table). Unlike several generations ago when every farm produced a little of almost everything (see Box) we now have regional specialization. Each farming area in the state specializes in what is best suited to the land conformation, soil, climate, and the market (see Map).

* Dr. Alderfer, now retired, is a former Economic Adviser of the Federal Reserve Bank of Philadelphia.

PENNSYLVANIA CASH RECEIPTS FROM SALES OF AGRICULTURAL PRODUCTS

1970

	(millions of dollars)	
Crops:		
Field crops	85	
Vegetables and potatoes	44	
Horticultural specialties	87	
Fruits	40	
Other	7	263
Livestock Products:		
Dairy products	448	
Meat animals and products	169	
Poultry products	160	777
Total		1,040

Source: 1971 Crop and Livestock, Annual Summary. Pennsylvania Crop Reporting Service, Harrisburg, Pa.

Lancaster County, blessed with just about the best of everything—landscape, soil, climate and nearness to market—is a veritable Eden. Lancaster ranks first among the Commonwealth's 67 counties in the production of wheat, corn, barley, hay, tobacco, dairy products, beef cattle, hogs, broilers, and eggs. Cash farm income in the county accounts for almost a sixth of the state's total. Within the county, however, there is considerable product specialization—each farm concentrates on one or two lines.

Livestock and livestock products in 1970 accounted for 75 percent of cash receipts from the sale of Pennsylvania farm products, and crops 25 percent. Since 1920, crops as a percentage of total farm production have been on the decline and livestock products have been on the increase. These changes were caused in part by the shift from horses and mules to tractors. This shift released

several million acres of crop land which formerly had to be devoted to the raising of feed for the draft animals. Moreover, raising livestock assumed greater importance as farmers turned more of their slopey and hilly acres into land for pasture in order to prevent good soil from being gullied and washed away by heavy storms.

DAIRY FARMING THE MOST REPRESENTATIVE

The dairy farm is the most representative farm in Pennsylvania. It contributes 42 percent of all cash farm income—more than any other type of farming, and for good reasons. Out-of-state competition can be met better with dairy products than with field crops. Milk, butter, and cheese find ready markets in the populous cities and suburbs nearby, and serving these markets has been facili-

BACK IN THE "GOOD OLD DAYS"

Uncle John's farm bordered the upper reaches of a small tributary of the Perkiomen Creek which flows into the Schuylkill River. The farm embraced about 50 rolling acres, including a few acres of streamside woodland. The big red barn had stalls for five horses and about 16 cows. Loose hay and loose straw were stored in the capacious loft.

A lean-to on one side of the barn sheltered a single-cylinder gasoline engine with two huge flywheels. Flopping belts, wobbly pulleys, and a long shaft carried noisy mechanical horsepower from the engine to the threshing machine—the major piece of equipment on the threshing floor. A lean-to on the other side of the barn sheltered a binder, a grass-cutting machine, a utility wagon, a harrow, a manure spreader, and a Sunday-go-to-meeting carriage.

Just beyond the manure pile in the barnyard was the pigsty with a half dozen ever-ready disposers of buttermilk and garbage. Nearby was a chicken house with nests for the brooders and layers and perches for uncounted others. There were also accommodations of sorts for ducks, guinea hens, and a few turkeys. And, of course, there were the inevitable corncrib, springhouse, icehouse, and outhouse.

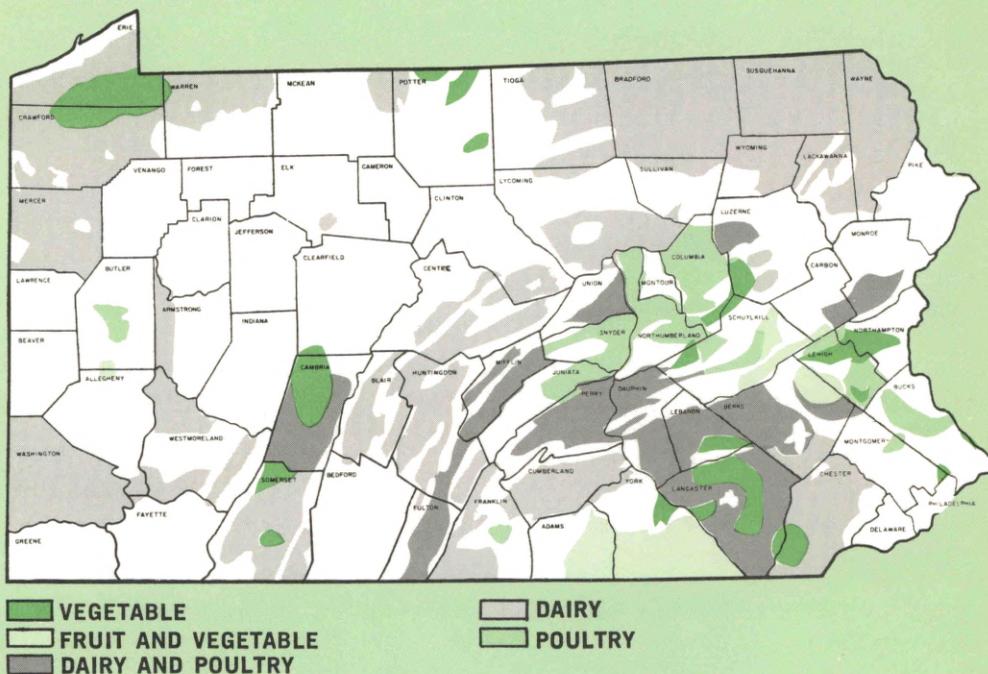
There was no running water but water was plentiful and was obtained with hand-operated pumps—one in the barn, one in the kitchen, and one on the porch outside the dining room. Cold drinking water was lifted with bucket and windlass from a deep well at the far end of the long stone house. The horses were served drinking water carried to them in a bucket; the cows drank their fill in the nearby stream.

On the tillable acres were grown corn, wheat, rye, oats, and potatoes, in some rotation. Grass for hay making was cropped from the meadow. Then there was a good-sized family garden with its variety of vegetables, an apple orchard, a mulberry tree, and a few cherry trees—sour cherries for pies.

Cream was separated from the milk by a Delaval separator and butter was made in a barrel-type churn—both machines hand-operated. Horses did the heavy field work but there was an endless amount of work requiring manpower. In those days a farmer was seldom seen without a pitchfork in his hands. All the manual labor on the farm was done by Uncle John, his muscular wife, their not-so-muscular daughter, and a hired man as elusive as a Pullman porter.

The farm was neither one of the best nor one of the worst. John and his wife worked hard, and she even assisted in the fields during harvest time. There must have been some cash farm income but cash was seldom seen except when city boarders paid for their summer vacations on the farm. Uncle John's only visible luxuries were chewing Red Man tobacco at work, and falling asleep in Sunday morning church. His wife had no luxuries at all unless you consider a hand-operated coffee grinder and a foot-operated sewing machine as luxuries. Farms of this type belong to auld lang syne.

PRINCIPAL FARMING AREAS IN THE KEYSTONE STATE



Source: *Pennsylvania Crops and Livestock Annual Summary, 1965.*

A line from Philadelphia to Erie would cross a half dozen physiographic provinces. Starting with the narrow, sandy coastal plain at the Delaware River, come, in succession—the Piedmont, a broad bank of rolling countryside; then the Great Valley, a beautiful and fertile lowland; the ridge and valley section with a contour that looks as if it had been scooped with a monstrous earthscraper by Paul Bunyan in an angry mood; then the Appalachian plateau—a wide, high, and handsome upland pockmarked in the northern extremities by a glacier; and finally the Lake Erie plain. On the whole, not the best landscape for farming, but good in spots.

The topography varies from tidewater to 3,213 feet above sea level. Half of the state is forested. The regions with poor soil or poor drainage are also unsuitable for farming as are the areas that are too hilly or too urban. Climate varies also. Frost-free days, good for growing crops, are as few as 127 days in some areas and as many as 211 days in other places. Average annual rainfall varies from a minimum of 34 inches to a maximum of 49 inches. All of this is good for farming.

tated by improvements in transportation and refrigeration.

The cow is a self-propelled, tractable, cud-chewing, biochemical wonder equipped with four stomachs, pipes and valves for processing corn, grain, grass, and water. In the course of a year Bossy produces tons of milk and manure and perhaps a calf. The milk nourishes man; the manure nourishes the soil. The calf, if female, becomes another cow in due time; if male, he goes to the abattoir for conversion into veal. If the value of all the cow's output is greater than the value of all the input, the farmer wins; if not, he loses.

Annual milk production per cow rose from an average of only a little better than 5,000 pounds in 1930 to 10,000 pounds in 1971. The doubling of productivity was achieved through a variety of developments in bovine breeding, feeding, and management. With artificial insemination of sperm from proved sires widespread enrichment of dairy herds has been attained. Balanced rations and greater use of grain concentrates have contributed much to the increased flow of milk per cow.

Modern management practices have greatly increased the efficiency of dairy farming. Milking machines, which have replaced hand milking, afford savings in time and labor and encourage larger herds. In elevated stalls or "parlor milking," the cow stands waist high with respect to the man doing the milking so as to eliminate tiresome stooping and reaching to attach and detach the machines.

A pipeline setup permits a dozen or more cows to stand next to each other in herringbone fashion on each side of the operator on each side of the operator's runway. The pipeline conveys the milk to the cooling room equipped for bulk storage from which tank trucks transport the milk to commercial dairies for processing. Milk pails and forty-quart milk cans are obsolete.

Dairy farms continue to grow larger, both

in size of herds and in acreage. A herd of 50 cows is now somewhere near the average, but some herds are as large as 500 to 600 cows. A farm of the latter size, with perhaps 1,000 acres of land to grow corn and small grains and some acreage in pasture, has tractors and other machinery for tilling the soil; silos, automatic feeders, barn cleaners, milking and milk handling equipment entail a capital investment running deep into seven figures. Such a farm is more than a way of life; it is an agronomic adventure.

CATTLE FEEDING A SPECIALTY

Fattening beef cattle for the sirloin-steak market of the East Coast is another agricultural specialty in Pennsylvania. In 1970 this activity was a \$169 million agribusiness catering to a clientele with a carnivorous appetite and the buying power to afford it.

Here is how the business goes. White-faced beef cattle, bred and raised on farms in Virginia, the Carolinas and other southern states, are shipped to the Lancaster Livestock Market where farmers buy the animals, fatten them right well on a diet of corn and barley, and then sell them to specialists for disassembly into filet mignon, rib roasts, and less elegant cuts. During a week last February, according to the *Lancaster Livestock Reporter*, auction receipts totaled 1,010 head of cattle compared with 848 of the previous week and 654 a year ago. These numbers are perhaps indicative of the healthy growth of cattle feeding.

Farmers engage in cattle feeding because it makes fuller use of farm buildings and equipment, keeps farm labor busy, makes the best use of forage produced on the farm, and brings in more cash than the market price for grains grown on the farm. Or is that rationalization on the part of those who just like to feed cattle? Running a cattle cafeteria involves risk. The market price of fattened cattle does not always cover the price of the lean cattle plus the costs of feeding them up to marketable weight and the anticipated

profit. Making a buck on cattle feeding requires shrewd business sense mixed with equal portions of farming skill.

POULTRY AND NEW TECHNIQUES

In 1971, sales of Pennsylvania poultry products totaled a tidy \$170 million—no “chicken feed.” About \$100 million came from the marketing of eggs, \$40 million from broilers, and the remainder from other fowl. Pennsylvania ranks about fifth among the states in egg production.

The hen’s egg is one of Nature’s largest single cells—a neat container of 55 different chemicals, a storehouse of nutrition, an architectural masterpiece said to be the most perfect single creation, and the hen’s hope of posterity.

Years ago, almost every farm had chickens scratching for food in the barnyard. The housewife tossed to them a daily ration of shelled corn, collected the eggs, and sold them for pin money. When hens outlived their laying life they were slaughtered for the meat—an alleged *pièce de résistance* for the visiting minister.

After World War I the economic stature of the hen began to rise. First, dual-purpose flocks were replaced by single-purpose strains. Techniques for “sexing” chicks improved, and only female chicks were sold by hatcheries. Egg productivity per hen was greatly increased through improvements in breeding, feeding, disease control, and overall poultry management.

The modern hen house is air-conditioned and electrically lighted. The hens work in long rows of metal cages, sometimes three hens to a cage, giving each bird only about three-quarters of a square foot of space. Down the length of each row and accessible to each hen is a trough never out of fresh water; immediately below is another trough supplying chicken feed. Slightly tilted floors cause freshly laid eggs to roll gently onto a moving belt that delivers the eggs to the receiving station adjacent to the office where

they are washed automatically and boxed for shipment. A henery is really an “egg factory.” Everything is automatic and efficient. It used to take about 7 pounds of feed to produce a dozen eggs; today it takes 4½ pounds or less.

Raising broilers is a highly specialized, high-speed form of agriculture. Broilers are bred in specialized hatcheries, fed on specialized farms, and bled in specialized dressing plants. Breeding parent stock of broilers has, in fact, become so specialized that some breeders have tended to concentrate on the development of male lines, while others have concentrated on female lines.

Broilers are given the same degree of care and pampering showered upon layers, but broilers are not confined in cages. Broilers in large flocks are free to roam in their air-conditioned apartments. The feed, often supplied by special arrangement with a feed dealer, is a computer-controlled blend or mix, including vitamins to assure a balanced diet and rapid growth. A broiler is a bird, and birds are by nature ravenous eaters. The growers assist Nature with a menu that will produce the maximum edible meat with the minimum expense in the shortest time.

Upon attaining marketable weight the broilers go to the dressing plant which is really an undressing operation, starting with fluttering, squawking birds at the head of the disassembly line and ending with a defeathered, eviscerated, singed, washed, and packaged-for-market broiler. Short and happy is the life of a broiler. The turnover is fast, profits are narrow, flocks are getting larger, and competition is fierce.

CROWN-HOLDER IN MUSHROOM PRODUCTION

Pennsylvania holds undisputed first place in the growing of mushrooms. To the country’s 1971-72 crop, worth \$107 million, Pennsylvania contributed \$64 million, or 61 percent. As a money crop, mushrooms outranked fruits, and even outranked vegetables.

Mushrooms were enjoyed by the Pharaohs of Egypt who considered them too good for the common people. They are still regarded as delicacies, but they cost much less than the steaks they so frequently garnish. About 1885, two florists ventured into a new sideline of raising mushrooms in the unused space under the benches in their hothouse. From that inauspicious beginning, Chester County's Kennett Square ultimately became the country's mushroom capital.

A mushroom is a fungus—a thallophytic plant, destitute of chlorophyll, without true roots, stems, or leaves, and deriving nourishment almost wholly from organic compounds. No wonder mushrooms are hard to grow!

Production of mushrooms requires a delicate touch. The process begins with the preparation of compost, which takes about four weeks; then the transfer of the compost into trays or beds in the windowless, dark mushroom house; next the pasteurization of the compost to kill all harmful bacteria, which takes three to ten days; then the planting of the spawn, or mushroom "seed" (best bought from a specialized producer); then casing, that is, topping the beds with a thin covering of soil and keeping the beds properly watered for three to four weeks; after which comes cropping, or harvesting; and finally, cleaning out and starting the next crop.

Mushroom growers have been facing steadily sharper competition from imports of canned mushrooms. In calendar 1972, imports were 50 million pounds, over 20 percent of the domestic production. Almost three-fourths of the imports came from Taiwan, most of the rest came from Japan, France, and Korea, in that order.

SPUDS PRODUCTION "NO SMALL POTATOES"

In some form or other the potato appears on almost every dinner menu and appears on the list of crops in every one of Pennsyl-

vania's 67 counties. Six geographically scattered counties, however, produce half the total tonnage. They are Lehigh, Erie, Cambria, York, Lancaster, and Potter—in that order as the cash register rings.

The current practice is to grow potatoes in areas specially favored by soil and climate, on big farms, with specialized machinery. A farm with 100 acres in potatoes very likely has 400 acres for purposes of crop rotation. Certified seed potatoes are machine-cut, machine-planted, machine-sprayed, machine-harvested, and machine-graded. The harvesting machine is a thing to behold—it unearths two rows simultaneously, shakes out the soil, removes the rocks from the potatoes which are then delivered by moving belt to the accompanying truck that hauls the harvest to the air-conditioned storage barn where the unloading is done by elevators. The gunny sack is obsolete. Stooping labor is obsolete. The term "small potatoes" is obsolete. Potato growing has become big business.

TOBACCO AND TLC (TENDER LEAF CURING)

Tobacco is Lancaster County's leading cash crop. The tobacco grown there is cigar tobacco, officially designated Pennsylvania Seedleaf, Type 41. The 1971 harvest brought the Lancaster growers of the weed \$10 million, but it took about \$10 million worth of stooping labor to grow the crop.

There is scarcely a month in the year that tobacco farming doesn't call for some attention. In late March or early April, sometimes before last year's crop is sold, soil beds for seeding must be prepared. When the tender seedlings are about six inches tall they are transplanted into straight rows in the fields. All summer long the plants require suckering, and endless warfare against weeds, bugs, and diseases. Toward the end of August comes harvesting when the farmer and his family cut the stalks and slip them on spear-pointed laths which are loaded on wagons

fitted with racks to haul the crop to the tobacco barn. Then comes the curing, a delicate operation requiring ventilation under careful supervision and skilled handling. By Thanksgiving time, when other field work is completed, the farmer works on his tobacco in the stripping cellar—removing the stalks, grading for length, inspecting for imperfections, and, finally packing for sale to the cigar manufacturer.

Growing tobacco is a labor-intensive type of farming which appeals to the Amish farmer who believes in keeping all young hands in his family busy in productive work. The Amish raise most of the Lancaster tobacco.

Once a local banker made a business call upon an Amish farmer who was at work in his tobacco shed. During the conversation the banker said "Do you mind if I smoke?" "No," replied the farmer, whereupon the visitor lit a cigarette. "Jake," said the farmer, "I'm ashamed of you smoking them things." "Well, it's tobacco," said the banker, summing his best defense. "Yes," replied the farmer, "but it's not Pennsylvania tobacco!"

APPLE GROWING: PROFITABLE AND PICTURESQUE

Pennsylvania is usually among the nation's half-dozen leading apple-producing states. Although apples are grown in all but one of the Commonwealth's counties, Adams County produces almost a third of the total. Nature favors Adams County and man helps.

Apple blossom time in Adams County affords one of the most picturesque sights in Pennsylvania. The scene is South Mountain which is not really a mountain, except by poetic license, but is a section of the Blue Ridge Mountains that pushes up through Maryland into Pennsylvania. Seldom does the Pennsylvania part of the upheaval rise above 2,000 feet. The peaks and crests are forested, the lowlands in summer are green with grass and corn. On the intermediate

elevations, seldom over 1,000 feet, are the apple orchards.

Fruit trees on the slopes and hillsides get the benefit of good air and water drainage. Cold air currents settle in the lowlands and thereby the apple blossoms escape the damaging effects of late spring frosts. Also, the maturing apples have a better chance of escaping the hazards of early fall frosts.

There are at least 338 different varieties of apples ranging, alphabetically, from Akin to York Imperial. About 70 percent of Adams County apples are York Imperial—a type used mostly for making pies.

Since 1952, the apple industry of Adams County has undergone quite a change. According to one authority, "Land values have escalated, taxes have gone up, labor costs have risen, and competent labor has grown scarce at any price." Inevitable consequences of these developments were mechanization and consolidation of orchard ownership.

Rising costs and labor shortages have induced the planting of trees on dwarfing rootstocks to produce smaller trees. Use of machines for topping and hedging has cut down labor costs of pruning. It is also easier to mechanize the harvesting of dwarf trees. Smaller trees can be harvested without climbing ladders which permits the employment of older workers and women. Dwarf trees also simplify the work of spraying—spray materials can be applied more efficiently. Labor costs of spraying have been reduced by applying more highly concentrated sprays to larger areas. A recent development is an integrated chemical-biological spray schedule. By using low-level sprays of not-so-toxic materials, predator insects are preserved to help rid the trees of destructive insects.

The York Imperial harvest goes directly to the processing plants for conversion into canned apple slices, applesauce, apple juice, cider, vinegar, apple butter, and apple pie mix. Golden Delicious and other fresh market apples, which account for 30 percent of the harvest, go into controlled atmosphere

storage where they stay fresh until demanded by the market.

TOMORROW'S TECHNOLOGY AND TRENDS

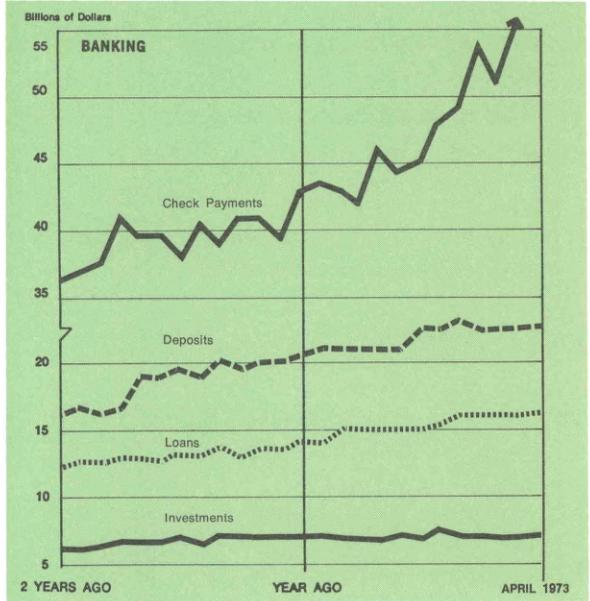
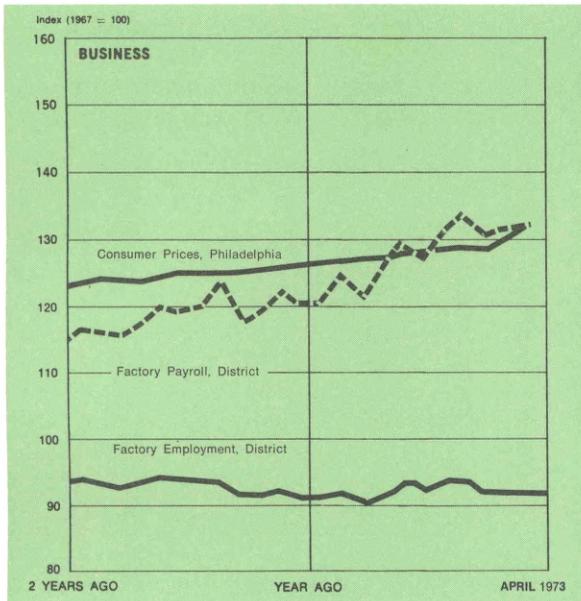
Technological innovations in agriculture—biological, chemical, and mechanical—have been more rewarding than is generally realized. Since the end of World War II, productivity, as measured by output per man-hour, has increased twice as fast in agriculture as in manufacturing. Pennsylvania farmers have obtained better yields for their efforts, but how about technology and trends for tomorrow?

The probabilities are that the total amount of land in Pennsylvania farms and the number of farms will continue to decline because of the growing commercial, industrial, and residential demands for land. Farms, both in acreage and in capital investment, are almost

sure to increase, as they have in the past, thanks to technology and specialization. Pennsylvania farmers may be conservative in many respects, but they have always been quick to accept new developments in farming, new kinds of agricultural machinery, new ways of fertilizing land, new breeds of stock, new grasses, fruits, and horticultural specialties.

The small family farm is giving way to the large commercial operation. Farmers are steadily becoming more sophisticated. They keep better records, are more knowledgeable in Animal Science, Plant Pathology, Entomology, and Agronomy. They consult their county agricultural agents, have their soil tested, and read reports they get from the Agricultural Experiment Station at Penn State University. No need to argue whether farming is an art or a science. In Pennsylvania it is both. ■

FOR THE RECORD...



SUMMARY	Third Federal Reserve District			United States		
	Percent change			Percent change		
	March 1973 from		3 mos. 1973 from	March 1973 from		3 mos. 1973 from
	mo. ago	year ago	year ago	mo. ago	year ago	year ago
MANUFACTURING						
Production.....				+ 1	+10	+11
Electric power consumed...	+ 5	+ 7	+ 8			
Man-hours, total*.....	0	+ 2	+ 4	+ 1	+ 7	N/A
Employment, total.....	0	+ 1	+ 2	0	+ 5	N/A
Wage income*.....	+ 1	+ 9	+11	+ 1	+14	N/A
CONSTRUCTION**.....	+106	+ 1	+ 6	+26	+19	+18
COAL PRODUCTION.....	- 2	- 1	- 3	+ 2	+ 2	- 2
BANKING (All member banks)						
Deposits.....	- 1	+ 9	+ 9	- 1	+12	+12
Loans.....	0	+15	+17	+ 2	+21	+21
Investments.....	0	0	+ 2	0	+ 2	+ 4
U.S. Govt. securities.....	0	- 2	- 3	- 1	- 5	- 1
Other.....	0	+ 1	+ 4	0	+ 6	+ 7
Check payments***.....	+ 10†	+41†	+31†	N/A	N/A	N/A
PRICES						
Wholesale.....				+ 2	+10	+ 9
Consumer.....	+ 1‡	+ 5‡	+ 4‡	+ 1	+ 5	+ 4

LOCAL CHANGES Standard Metropolitan Statistical Areas*	Manufacturing		Banking					
	Employment	Payrolls	Check Payments**		Total Deposits***			
	Percent change March 1973 from	Percent change March 1973 from	Percent change March 1973 from		Percent change March 1973 from			
	month ago	year ago	month ago	year ago	month ago	year ago		
Wilmington.....	- 1	+ 4	0	+23	+ 3	+ 54	- 1	-89
Atlantic City.....	0	+11	+ 2	+16	+ 8	+ 24	- 2	+13
Bridgeton.....	- 1	+ 5	N/A	N/A	N/A	N/A	0	+13
Trenton.....	+ 1	+ 2	+ 1	+ 7	+41	+ 77	- 6	+ 9
Altoona.....	- 1	+ 1	- 1	+ 2	+14	+ 15	+ 1	+14
Harrisburg.....	+ 1	+ 5	+ 3	+16	+ 3	+ 24	- 3	+17
Johnstown.....	+ 1	+ 1	+ 5	+ 9	+ 8	+ 11	+ 1	+18
Lancaster.....	+ 1	+ 9	+ 2	+14	+ 9	+146	- 1	+16
Lehigh Valley.....	+ 1	+ 3	+ 2	+14	+ 5	+ 27	- 1	+13
Philadelphia.....	0	0	0	+ 6	+ 8	+ 33	- 1	+13
Reading.....	0	+ 2	+ 2	+12	+17	+ 9	- 2	+19
Scranton.....	0	- 2	+ 1	+ 6	+ 1	+ 8	- 1	+11
Wilkes-Barre.....	+ 1	+ 1	+ 5	+ 9	+19	+ 46	- 2	+31
Williamsport.....	0	+ 4	+ 2	+16	+14	+ 35	- 1	+72
York.....	- 1	- 3	0	+13	+ 6	- 39	- 1	+14

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

†15 SMSAs
 ‡Philadelphia

*Not restricted to corporate limits of cities but covers areas of one or more counties.
 **All commercial banks. Adjusted for seasonal variation.
 ***Member banks only. Last Wednesday of the month.



FEDERAL RESERVE BANK of PHILADELPHIA
PHILADELPHIA, PENNSYLVANIA 19101

business review

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