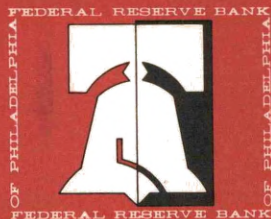


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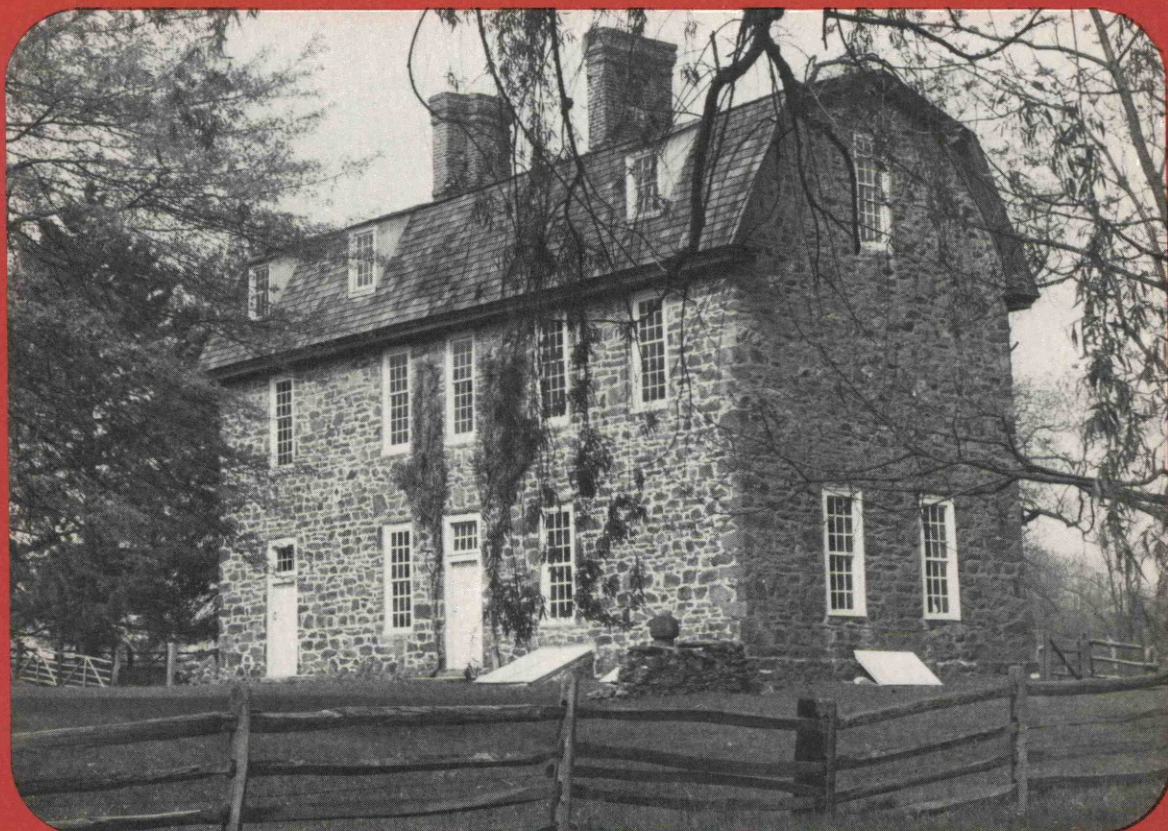
An Economic Compact for the Latter '70s

Why America's Oil Supply Depends
On High-Priced Foreign Sources

Shortages: A Necessary Evil of the Future?

FEDERAL RESERVE BANK of PHILADELPHIA

business review



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On our cover: Graeme Park, located about a mile west of US 611 near Horsham, Pennsylvania, affords an insight into the life of an eighteenth-century American "country gentleman" and his family. The "Long House" pictured here was built by Provincial Governor William Keith in 1721-22. Thomas Graeme, a noted Philadelphia physician and Pennsylvania Supreme Court justice, bought the property in 1739. Lovely and picturesque in its rural setting, Graeme Park provides the modern visitor with an unusual glimpse of the ingenuity of colonial Pennsylvanians. (Photo by the Pennsylvania Historical and Museum Commission, Harrisburg, Pa.)

BUSINESS REVIEW is produced in the Department of Research. Editorial assistance is provided by Robert Ritchie, Associate Editor. Ronald B. Williams is Art Director and Manager, Graphic Services. The authors will be glad to receive comments on their articles.

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An Economic Compact for the Latter '70s

*By David P. Eastburn, President
Federal Reserve Bank
of Philadelphia*

In the second half of the '70s we are likely to see considerable economic conflict. The form may be increased labor disputes, consumer protests, and other venting of frustrations that build pressure for drastic action by government officials. The underlying cause will be conflict over shares of the gross national product. How divisive this conflict turns out to be will depend on how intelligently and decisively government officials come to grips with the sources of it.

One can imagine, on the one hand, a scenario in which economic policymakers will be ineffective in reducing inflation and the inequities that go with it. Those who ordinarily benefit from inflation will gain even more than they have up to now; those who tend to lose out from inflation will suffer still further. One of the most insidious evils of inflation is that it pits one group against another, forcing each person to look out for himself regardless of the consequences for others.

The resulting conflict could be traumatic indeed.

A different scenario, on the other hand, envisions a set of policies that meet the needs of upper-, middle-, and lower-income groups in such a way that each is more or less content with how the national product is divided. This scenario envisions, to borrow a term from current British policy, a compact in which all three income groups agree to a common course of action.

The need to reach such a compact will be especially acute because the GNP is likely to grow relatively slowly in the foreseeable future. If, as in the first scenario, inflation is not controlled or its effects mitigated, the outcome a few years down the road may be a thoroughly disrupted and demoralized economy. Such an economy would likely produce an actual decline in output much more severe than experienced so far this year. A policy of continuing

to fight inflation, however, also means slow growth. Just as our current inflation took some nine years to develop, it will take at least a couple of years to unwind. Persistent and deliberate policies to moderate growth of the economy will be essential.

In either case, various groups in our society will be competing for slices of a slowly growing GNP pie. When output is growing rapidly and there is more to go around, everyone can be more or less satisfied. With slow growth, attention becomes focused on *relative* shares and conflict intensifies.

A program to minimize this conflict should have three interrelated articles:

- I. Increasing productive capacity.
- II. Slowing inflation.
- III. Spending more for the disadvantaged.

This program would meet, respectively, the major concerns of upper-, middle-, and lower-income groups and form the compact among them.

ARTICLE I: INCREASING PRODUCTIVE CAPACITY

Some business analysts are projecting that over the next 10 to 15 years funds will have to be poured into plant and equipment at a rate at least one-and-a-half times the rate of the last dozen or so years just to maintain real economic growth at its historical average—about 4 percent. Needs for larger capacity in a number of basic industries are apparent from current shortages, even at a time of sluggish growth. Needs for increased capacity to produce public and social services—urban transportation, low-income housing, improvement of the environment, and the like—have been obvious for years.

But there is a very real question of just how to boost our ability to produce. One method currently proposed for increasing productive capacity is to divert the flow of credit from “non-productive” to “productive” uses. I don’t believe this would work because I doubt that any government official can determine which uses are productive and which are not. Past attempts to do so have not been particularly successful

and there is no reason to believe we know any better how to do the job now.

Another way to encourage an increase in capacity would be to manipulate interest rates. The importance of interest rates in businessmen’s decisions to increase capacity has long been debated, but it is clear that low rates would make attractive some projects that are not profitable at high rates. Unfortunately, deliberate attempts to force interest rates down would also aggravate inflation. This would inevitably mean flooding the economy with money that would eventually serve to bid up prices—including interest rates themselves.

The key to boosting productive capacity, in my opinion, is to make it profitable to do so by bringing down inflation. As matters now stand, something between a third and a half of today’s record-high (long-term) interest rates constitutes the investor’s hedge against inflation, a device for protecting himself against the fact that his interest receipts will be in cheaper dollars. Once the investor becomes convinced that inflation is no longer inevitable, he will be content with lower interest rates. Reduction in the inflation component of interest rates is not likely to stimulate increased capacity by itself. But the winding down of inflation is likely to increase investors’ confidence in the stability of the economy. This confidence produces a further reduction in the return investors require on their funds and, in turn, will make it more profitable for producers to expand capacity.

Reducing inflation, however, will take time. It might be helpful if we can induce businessmen to maintain, if not enlarge, capacity during the interim. One key to doing so is corporate profits. When corporations enjoy strong profit performance they can plow earnings back into plant and equipment and raise capital in the securities market. Corporate profits (before taxes) relative to replacement costs have trended downward in the past two decades. This trend was reversed briefly during the early ’60s but resumed again in the latter ’60s and reached a low in 1970. An improvement in this trend could help probably more than anything else to encourage an increase in capacity.

A better measure of the ability of corporations to raise investment funds (which includes profit performance) is the market value of their securities relative to replacement costs for capital goods. When the price they can get by floating new securities rises relative to the cost of replacing their plant and equipment, it is easier to finance increased capacity. Between 1951 and 1965 corporations were able to finance their investment plans with increasing ease. This trend was reversed in the mid-'60s, however, and corporations found the securities market an increasingly costly place to finance capital expenditures. An increase in stock prices, a reduction in interest rates, and a slowdown in rising prices of capital equipment could turn the situation around. All could come from a lessening of inflation.

Many things are responsible for this situation, but government can help mitigate it. As a start, making the effective tax rate more impervious to inflation might be desirable. For example, basing capital depreciation allowances on the current costs of replacing capital equipment, rather than historical costs, would help in eliminating the upward lift that inflation gives to corporate income tax rates. Another step along these lines would be to modify tax rates on increases in the value of corporations' inventories owing merely to inflation. This too would help to keep corporate taxes more in line with true corporate income during inflationary episodes.* Congress should continue its exploration of other possible changes in capital gains taxes to stimulate investment. Of course, fiscal measures such as these must not be permitted to throw the budget out of balance and thus frustrate anti-inflation efforts. But within this constraint these measures may be able to diminish the costs of reducing

inflation by encouraging expansion in capacity and, hence, output.

This article of the compact should have a great deal of appeal for businessmen and upper-income groups. It might be greeted with less than enthusiasm by those in the middle-income group because it means a shift in emphasis from consumers' goods to producers' goods—from cars, TVs, and houses to factories and machine tools. It is the individual in the middle-income group who buys most of these consumer goods in our economy. He is unlikely to be turned on by a vague need to increase industrial capacity. There must be something in the compact meaningful for him.

ARTICLE II: SLOWING INFLATION

Economists know much less than they would like about who benefits and who suffers from unanticipated inflation. Recent analysis suggests that those in the middle-income group may tend to benefit compared with others as inflation accelerates because they are relatively large debtors. They are the ones who buy on installment and those who owe most of the mortgage debt. To the degree that higher prices do not get fully built into interest rates, these debtors gain because they pay back their debt in cheaper dollars.

Those in the middle-income tier, however, appear to have suffered relatively on the earnings front. As inflation has accelerated, their income has not kept pace with national income. There is no question that inflation is uppermost in the minds of the middle-income classes. Polls indicate that they believe government is primarily responsible for inflation so it is reasonable to believe that they look to government for a solution.

Economists have talked for years about the "money illusion" which deludes the unsophisticated person into thinking his lot is improving when all along he is being cheated by rising prices. The reverse effect may well be at work today. I believe that people in the middle-income category want inflation to end badly enough to give up some consumption in order to make it happen.

*These two aspects of corporate taxes played a measurable role in pushing up the effective tax rate on true corporate income from 37 percent in 1967 to 43 percent in 1972 to 49 percent last year. This compares to the downward slide in corporate taxes from 48 percent in 1960 to 37 percent in 1967—a period also characterized by a marked increase in the share of GNP going into investment as well as a sharply rising rate of capital growth. Source: William D. Nordhaus, "The Falling Share of Profits", *Brookings Papers on Economic Activity*, I, 1974, table 5, p. 180.

In short, meaningful efforts to slow inflation would likely satisfy the major concern of those with middle incomes. It would be enough to induce them to agree to the compact. But what about those in the lower-income group?

ARTICLE III: MORE FOR THE DISADVANTAGED

Although the recent increases in food and fuel prices have hit them hard, the poor and minorities generally do not suffer from inflation as much as is commonly thought. Their main nemesis is unemployment. And this presents a problem. For if inflation can be conquered only by slow growth of the economy, this inevitably will mean higher unemployment. And, unfortunately, when total unemployment rises, unemployment among the disadvantaged rises much more—hence, the need for the third article of the compact.

The disadvantaged must be insulated from the devastating effect of generalized unemployment. One whole category of policies would be compensatory. This category includes unemployment compensation, income maintenance, and government employment. These are all to the good and should be used. Reform of the welfare system or, preferably, its substitution by some form of family income maintenance is especially important. A program by which the Federal Government would become a sort of employer of last resort is also an idea that should be tried.

All these efforts, however, are second best to basic programs which would upgrade the competitive position of the disadvantaged. These include training and education which would help to make people more productive members of


society. Such an improvement would tend to reduce the incidences of unemployment among this group.

All this, of course, would cost money and would have to come out of the Federal budget. If the budget is to remain at or near balance, as it should to combat inflation, money for these social programs would have to come from some other category. The biggest and most obvious candidate is defense.

This third article of the compact can be the basis for a meaningful social program which the nation badly needs, but it must be sold as more than this. It is a vital part of a total package necessary to increase capacity to produce and to control inflation. Together with the other two articles it can enable the nation to weather a difficult time ahead with a minimum of conflict.

COMPACT OR CONFLICT?

The second half of the 1970s could place some additional burdens on all of us as economic policymakers attempt to put the economy in order. Policies to bring down inflation and curb its attendant inequities will play a significant role in determining the size of the burden and whether it is born equitably.

If economic policies do not work to produce a fair sharing of this burden, increasing unrest and conflict could result. If, however, an economic compact is reached, whereby all individuals, whether high-, middle-, or low-income, share the load in an equitable fashion, the economic strains of the last half of the decade should be decreased. An economic strategy aimed at boosting the ability to produce, bringing down inflation, and aiding the disadvantaged should provide the necessary ingredients for such a compact. 

Why America's Oil Supply Depends on High-Priced Foreign Sources

By Vincent A. Gennaro

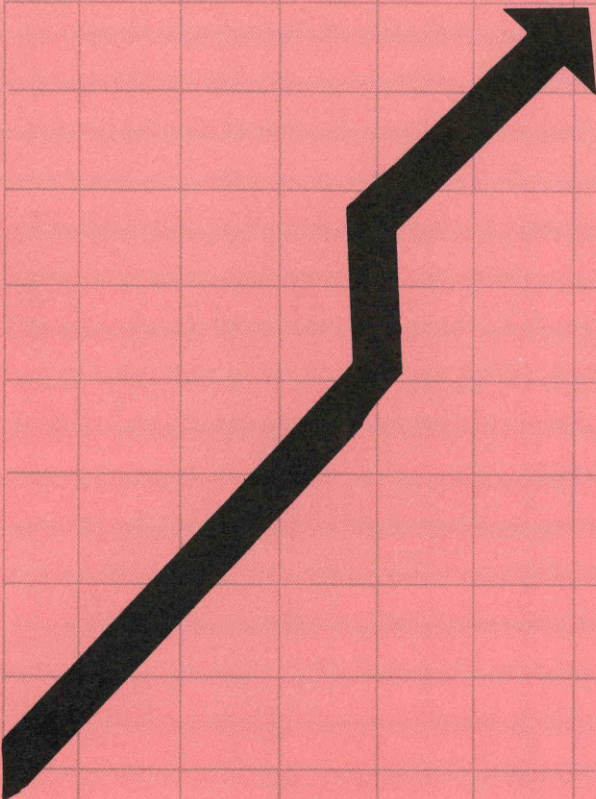
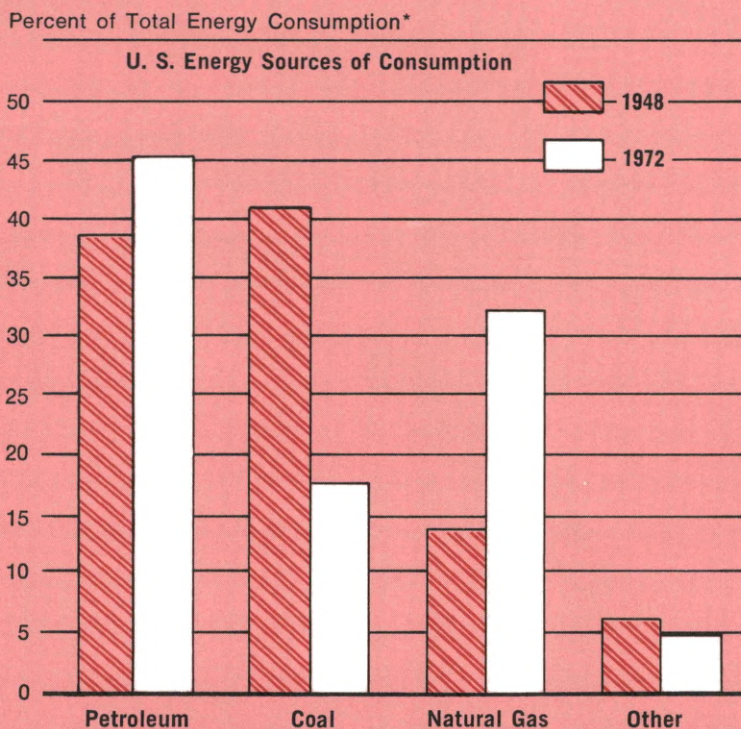


CHART 1

OVER THE LAST 25 YEARS, THE UNITED STATES HAS INCREASED BOTH ITS DEMAND FOR ENERGY AND ITS DEPENDENCE ON PETROLEUM AND NATURAL GAS AS ENERGY SOURCES . . .



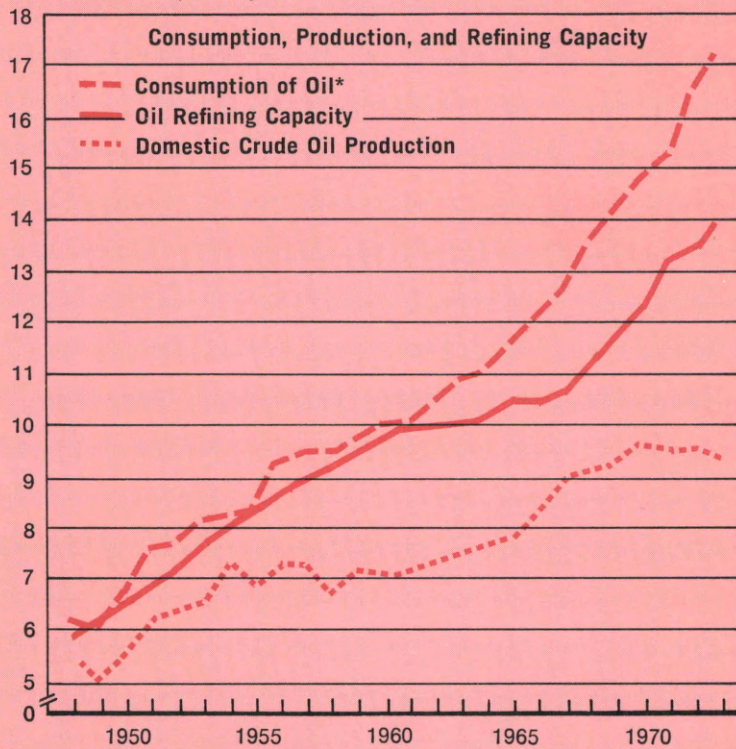
* Total energy consumption for 1948 and 1972 was equal to the energy equivalent of 16.0 and 35.7 millions of barrels of oil per day respectively.

Source: John D. Paulus, "The Outlook for Petroleum Prices and Supplies," prepared for the Committee on Business Analysis, Board of Governors of the Federal Reserve System, 25 June 1974.

CHART 2

BUT DOMESTIC CRUDE OUTPUT, REFINERY CAPACITY, AND PRODUCTION OF REFINED OIL HAVE LAGGED FAR BEHIND DOMESTIC CONSUMPTION.

Millions of Barrels per Day

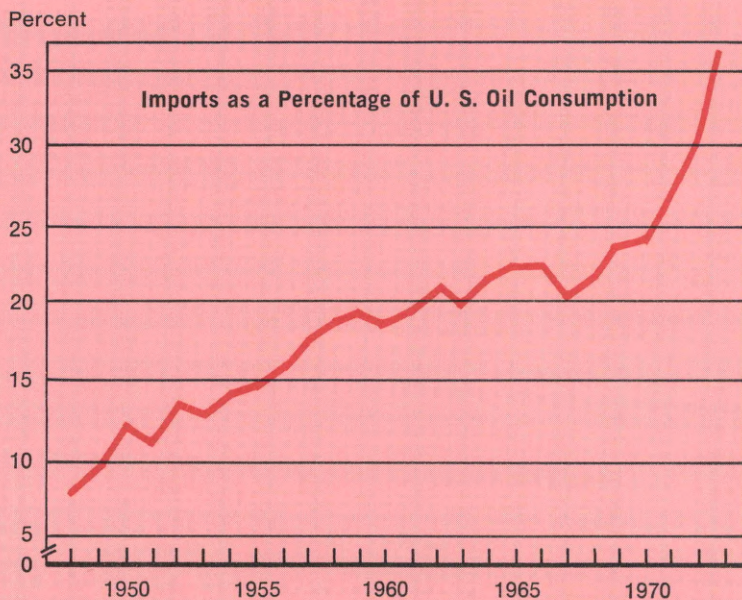


* Includes natural gas liquids.

Source: John D. Paulus, "The Outlook for Petroleum Prices and Supplies," prepared for the Committee on Business Analysis, Board of Governors of the Federal Reserve System, 25 June 1974.

CHART 3

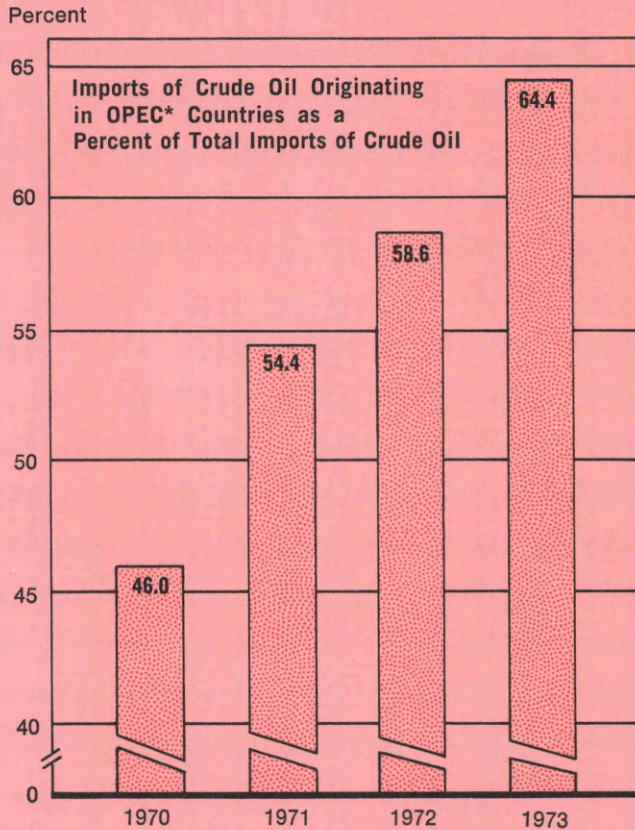
THIS HAS RESULTED IN A GROWING DEPENDENCE ON IMPORTED OIL . . .



Source: *Survey of Current Business*.

CHART 4

MOST OF WHICH COMES FROM A CARTEL OF OIL-PRODUCING NATIONS.

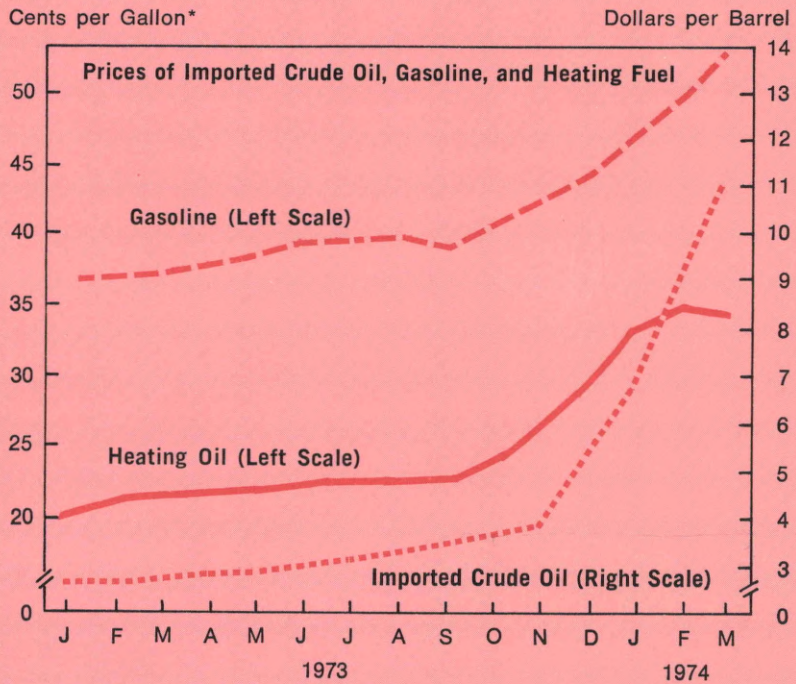


* OPEC countries include United Arab Emirates, Algeria, Ecuador, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, and Venezuela.

Source: U. S. Department of the Interior, Bureau of Mines.

CHART 5

THIS LEAVES LITTLE CHOICE IN THE SHORT RUN BUT TO PAY RISING PRICES FOR CRUDE OIL IN WORLD MARKETS, RESULTING IN HIGHER PRICES FOR HEATING OIL AND GASOLINE.



* Consumer prices.

Source: Morgan Guaranty Survey, May 1974.

Shortages: A Necessary Evil Of the Future?

By Donald L. Raiff

Their grocery carts colliding, two shoppers at the local supermarket scramble for the last roll of paper towels. Across the street, a long line of automobiles waits for gasoline. These and similar scenes have been publicized by the popular press as examples of recent material shortages in the U.S. economy.

To some people, today's "shortages" portend more empty shelves in the local markets as well as depletion of "necessary" raw materials. Yet, Government price controls appear to have been a fundamental cause of the product shortages. Holding prices down encourages heavy demand for goods and discourages suppliers from increasing their output. Thus, current shortages need not suggest continuing problems provided the future is free of price controls.

But what about the chance that market forces

may fail us and that we will eventually run out of a "necessary" raw material? Although this scenario is a possibility, economic analysis suggests a *more likely path*—increases in the prices of materials in short supply relative to those that are not so scarce. The higher price of the scarce commodities will then make it more practical to conserve remaining supplies and search out substitutes.

Some citizens may actually prefer shortages to the price rises necessary to clear the market. They want to allocate goods by nonprice methods during normal times as well as for periods of a national emergency to protect certain groups such as the poor. However, in these instances, a better solution would be to have the Federal Government provide the poor with income through direct transfers, while allowing

price movements to provide incentives for conserving resources and allocating available commodities.

SHORTAGES: THE NATURE OF THE BEAST

Perplexed Charlie Consumer asks: "How can anyone blame the Government for the product shortages? Our gasoline shortage resulted when OAPEC (Organization of Arab Petroleum Exporting Countries) tried to slap an embargo on oil shipments to America. So, the Arab exporters were the culprits, weren't they?"

OAPEC members played a key role in originally decreasing the quantity of oil brought to the U.S. market and causing the initial scarcity. *Yet, neither smaller supplies nor larger demands by themselves imply shortages. Only if prices are unable to move upward will de-*

creased supply or increased demand promise a shortage. Thus, the Federal Government turned the initial scarcity into a shortage by preventing price rises to the consumer.

When studying shortages an economist zeroes in on prices. In his view, there's a situation of excess demand—a shortage—when at the current market price consumers demand more of a product than the market can immediately supply. If there is a shortage at this price, economic theory holds that the market price will eventually move upward to a level that eliminates the shortage (see Box 1). The shortage will vanish as higher prices cause buyers to review their spending plans and cut back on those items becoming relatively more expensive. Also, profit-motivated suppliers will find the higher prices an incentive to increase the amount they bring to market.

BOX 1

WHAT ABOUT LOCALIZED ONE-TIME SHORTAGES?

The product shortages referred to in the text of this article are those experienced across regions in the U.S. by large numbers of firms or large numbers of consumers over a long period. Other localized shortages occur occasionally because of one-shot breakdowns in the distribution process, an inability to anticipate consumer demand over short periods, and/or an unwillingness to vary certain prices daily.

If a bread truck breaks down so that its normal Monday store deliveries can't be made until Wednesday, shoppers will most likely find a shortage of bread. Prices will probably not be raised on Monday to allocate the available bread because the grocer would be accused of taking advantage of a bad situation—windfall profits. Unless the supply, for at least this Monday and Tuesday, responded to higher prices, the grocer would probably plead for continued goodwill for himself and bad feelings for his supplier, while leaving prices unchanged.

Attending a theater for the opening of a highly publicized movie may provide another example of a local shortage—theater seats. Why shouldn't the theater manager raise the admission to discourage some of the demanders, save the long lines, and eliminate the uncertainty of such an admission policy based on queues? A number of reasons enter the manager's judgment to change his pricing policy. How would he get this information out to his potential market? Since the demand may differ between the 7 and 10 o'clock shows, he would have to vary his price to attract just enough people to "fill the house." For the sake of simplicity and goodwill, he may decide to keep the price unchanged and allocate by way of long lines. In this way any disappointment of a potential movie-goer is usually voiced against the people ahead of him in line rather than the price setter—the theater manager.

Would there necessarily be a shortage if a large number of suppliers suddenly withheld their product from the market? No. If prices were allowed to move upward, this would allocate the available items as well as provide suppliers incentive to stop their withholding action. Thus, newsmen observing the situation would report rising prices, but no lengthening of the waiting lines or shrinking inventories of goods. "Everyone seems to be able to obtain the amount they desire to purchase" would be the report because the "symptoms" of shortages would not be evident to the newsmen.¹

Arguments that rising prices will not eliminate the shortages imply that consumers and producers make decisions independent of the price level. However, as long as either the supply or demand is even slightly responsive to price changes, a price increase will eventually eliminate the shortage.² The price will rise to a market-clearing level—the level which will spur

producers to supply exactly the quantity demanded by customers. It is true that the size of the hike necessary to clear the market hinges on the market participants' sensitivity to price changes.

PRICE CONTROLS IN A CHANGING ECONOMY INSURE SHORTAGES

The demands of both domestic and foreign consumers, as well as the supply intentions of firms and labor, can change—sometimes rapidly. Increases in demand and/or decreases in supply will raise the level of the market-clearing price. If Government controls hamper the free movement of market prices, these prices are prevented from doing their double duty—*rationing the available commodity among competing shoppers and providing the necessary incentive for businessmen to expand their output*. Without the assistance of upward price movements, demanders will not be able to find adequate supplies of the products they desire. Nonprice rationing schemes such as queues and, in some instances, black markets will spring up to allocate the available commodities. Suppliers may even attempt to cut costs by changing the product (see Box 2).

Changing Demands Alter Market-Clearing Prices . . . The idea that the amount demanded of most goods will rise as the price of that product

¹Rising prices should not be called a symptom of shortages but rather the normal market adjustment to a decrease in supply or increase in demand. The main shortage symptom is when consumers are unable to obtain the amount they are actively trying to purchase.

²The precise process which generates the rise in the market price is probably a combination of unsatisfied demanders offering higher prices and suppliers raising their selling prices as they notice the unsatisfied demand.

BOX 2

CONTROLS GERMINATE A NEW ALLOCATION DEVICE AND PRODUCT ALTERATIONS

On August 15, 1971, the U.S. Government dramatically enlarged its efforts to control reported market prices (wages are the price for labor services).^{*} This price control effort clamped ceilings on many of the prices of items sold in the United States. Some of the ceiling prices changed as the Federal effort moved through its various phases. But the relevant question is whether the official ceiling was below the price which would have equated the quantity supplied with the quantity demanded—the market-clearing price. If so, the quantity must be allocated through a nonprice method (such as—first come, first serve), and/or suppliers may cut costs by altering the product.

Continued on next page

Box 2 (Continued)

For illustrative purposes, consider the most recent example of price ceilings in the face of a large decrease in supply—the automobile fuel market, during the first quarter 1974. Evidently the quantity brought to the coastal markets by the suppliers was neither as great as that sold in similar periods a year before nor as great as the contemporary quantity demanded, given the posted prices. During this period posted prices were allowed to rise a few cents—as the Cost of Living Council and then the Federal Energy Office allowed increases in crude oil costs to be passed along. But this allowable price increase did not consider the effect of a decreased quantity brought to market and the price rises *necessary* to induce users to buy a reduced amount. Consequently, customers experienced rationing by other methods such as queuing, maximum purchase sizes, and sales only on alternative days depending on the odd or even number on the license plate.

Besides the nonprice allocation schemes, the purchased product changed. Before the oil embargo last year, gasoline was sold as a “joint product” with the services of windshield cleaning and a check under the hood “with a smile.” In addition, sellers vied to make sure the consumer had a 24-hour daily option on such purchases. With Federal orders controlling the pump price, sellers profited only by curtailing costs and thus the services supplied. The result was shorter hours (7 A.M. to 10 A.M. was frequent in the Philadelphia area) and less frequent delivery of the ancillary services accompanied by attendants’ smiles.

*Before 1971, the U.S. Government has regulated prices for such products as electricity, telephone services, and even a bank’s depository services.

falls and vice versa is a familiar one. However, there can also be an “increase in demand” for the product. This increase in demand means that consumers want even more of the commodity at the current price than they wanted previously. They are also willing to pay more for the same amount of the product than they would have earlier. For example, what would happen within a community if each person receives an unexpected \$5,000 tax rebate? Suppose also there exists in this community a small combination manufacturing and retail business for mahogany furniture called Ethan’s Place. This firm’s hand-crafted Early American line is the “luxury” many residents want to buy with their new-found dollars. Before receiving the rebate, they just couldn’t afford the purchase, but now many more can. This increase in demand for furniture will be recognized first in the retail outlet, as floor samples are sold in an attempt to satisfy the growing number of back orders. The owner’s

natural response would be to increase production, but the manufacturing plant is already operating with a full shift of workers. To expand output, Mr. Ethan must pay his laborers time and a half for overtime, and this will increase costs per unit of furniture. If the firm is to expand output to meet the increased demand, it must charge a higher price to cover these rising per-unit costs and maintain profits. A general premise for any firm is that unless output can be expanded without increasing per-unit costs, increased demand will force prices upward until the market is cleared with increased output.³

³Over long periods, firms can adjust their production technology and possibly lower the per-unit costs of production and even new firms may enter the industry. But not all industries have technological breakthroughs or gain large economies by increasing the number and size of firms. Those *without* such breaks rely on increased prices to justify increased production.

. . . **But Movements Are Stymied by Price Controls.** If prices are fixed by Government fiat, the market response would be stymied. The owner of the furniture-manufacturing outlet will spot the increased demand in the same way—increased orders and lower inventories. But, *if his per-unit costs rise* with any increase in the quantity brought to market, he will not increase the amount supplied because doing so is unprofitable. He cannot recover higher unit costs by raising prices because of Government price controls. The result is a shortage of this Early American furniture, and an upsurge in cocktail party inquiries as to why Mr. Ethan doesn't increase production and eliminate the shortage.

The U.S. natural gas industry is a good example of the actual problems caused by price controls during a period of rising demand. The agreement to fix prices at the wellhead goes back to 1954—a time when natural gas was plentiful at the market price.⁴ As possible uses of the product were expanded, demand increased yet prices were held down by the Federal Power Commission, at least relative to other fuels. The accelerating popularity of natural gas and its accompanying scarcity seems to stem from the U.S. Government's effort to hold down the price of natural gas. The low price spurred demand but failed to provide sufficient incentive to increase production.

While the price of natural gas rose 20 percent between 1950 and 1970, that of coal soared 80 percent, and that of heating fuel jumped 33 percent. In 1972 the cost of heating a home with gas in U.S. averaged 29 percent less than heating by fuel oil and 52 percent less than the cost of heating by electricity. As a result, consumers are now using natural gas faster than reserves are being discovered, natural gas inventories are declining, and in some areas new hookups are not

being accepted. Prior to 1969, the annual addition of new reserves of gas exceeded production in the United States. But from 1968 to 1972, the annual addition of new gas reserves averaged only 47 percent of the production from existing reserves. In 1973, reserves totaled only 270 trillion cubic feet—a 12-year supply at current use levels.

Although there has been a steady decline in the production of existing gas reserves, an estimate for "potential" natural gas supplies (that is, gas not yet in proved reserves, but either identified or predictable according to acceptable geological knowledge) in the United States as of December 1972 is 1,146 trillion cubic feet. The significance of these "potential" natural gas supplies becomes apparent when it is understood that 1,146 trillion cubic feet is more than 49 times America's consumption in 1973. Thus, the natural gas shortage resulted *not* from an inadequate domestic resource base, but from the lack of an economic incentive to remove gas from the ground because of controlled wellhead prices.⁵

Supply Changes Can Alter the Market-Clearing Prices. . . Other forces that can alter the market-clearing price are changes in supply. If demanders' plans are unchanged, a "decrease in supply" will force a rise in the clearing price. This decrease in supply means that suppliers reduce their output at current prices. Similarly, they must get a higher price for their goods to maintain their original level of output. For example, what happens in the furniture town referred to earlier if there's no tax rebate, but rather the suppliers of mahogany are able to conspire and double their price for the wood needed in Mr. Ethan's manufacturing prices? Now, his per-unit costs increase across the board regardless of his level of output. Recognizing the need to pass along this input-cost rise to

⁴In 1938 Congress passed the Natural Gas Act for the purposes of placing pipelines selling natural gas in interstate commerce under the regulatory authority of the Federal Power Commission. The act was specifically made inapplicable "to the production or gathering of natural gas." Sales of gas at the wellhead by independent producers thus continued unregulated by the FPC until the 1954 Supreme Court decision in *Phillips Petroleum Co. v. Wisconsin*.

⁵See "Toward an Adequate Natural Gas Supply" published by the Gas Supply Committee, 1725 DeSales Street, N.W., Washington, D.C., September 1973, Sections II-III; and "Federal Oil and Corporation Gas Proposals," Legislative Analysis No. 18 (Washington: American Enterprise Institute for Public Policy Research, 1974).

maintain his profits, he quickly decides that only a price increase can keep him in business. The level of demand for the furniture has not changed; therefore, some people considering future purchases will be discouraged by the higher price and buy something else instead, thus decreasing final output.

... But Movements Are Stymied by Price Controls. If posted prices are fixed by Government fiat, the market response is blocked. The supplier recognizes the need to increase prices in the same way—his cost of raw mahogany has increased. With the option of raising prices sealed off, he exercises other options which may involve cutting unit costs even to the extent of lowering product quality or changing its design. If he cannot discover a way to attain an acceptable rate of return over the longer haul, he will go out of business.

Beef is a good example of an industry that experienced supply shifts while under Federal price controls in 1973. As cattle feed prices rose throughout 1973, suppliers attempted to pass on their cost increases through slaughtering, packaging, and retail sales to the consumer. Some shoppers switched to less-expensive foods and bought less beef. However, cattlemen were generally able to pass along their cost increases until meat prices were frozen in late March (continuing through September 10). The meat industry, faced with a lid on retail prices and few quick cost-cutting measures, essentially shut down the slaughtering and packaging of production.

Some retailers, to stay in business, sold beef at a loss while attempting to make their profit on other products carried in their markets. However, in general, sparsely filled meat counters were the order of the day, despite the continued relative abundance of cattle.

Problems in Domestic Markets for Products Traded Internationally. A ceiling price will also produce shortages when there are two markets for a single product—one controlled, the other uncontrolled.

Consider the United States's domestic and export markets. Firms export if the price they can obtain in foreign markets exceeds that obtain-

able at home. The difference must be wide enough to cover differential shipping and marketing costs between the two markets. Suppose that for some reason—increases in demand or decreases in supply—the world price of a product increased. In the domestic market, effective Government intervention may keep the U.S. price from rising. However, it cannot keep the world price from rising relative to the prevailing U.S. price. If the spread between the domestic price and the value of the item in the foreign markets becomes wide enough to cover exportation costs, the American firm may find it more profitable to sell to foreigners abroad rather than to purchasers at home, as the latter are limited in the price they can offer. This situation will swell exports and probably shrink domestic supplies for all products affected.

The aluminum industry illustrates this point. Aluminum will be facing a severe "capacity crunch" during the next several years. The beginnings of a tight supply situation can be followed through two periods. First, the industry's profitability declined during the sluggish period of demand at the beginning of the 1970s. Second, during the subsequent period of booming sales, the industry failed to attain a return on investment large enough to justify the new facilities required to meet the projected demand of the mid-decade. It is the latter period where price controls played a role.

Domestic and foreign demand for aluminum recovered sharply in 1972, and the supply situation became very tight in 1973. With supplies tightening, the selling price for ingot aluminum in the spring of '73 finally reached the published price of 25 cents per pound, ending more than three years of selling at a price discounted below the list price. Continued price recovery was thwarted by the establishment of a 25-cent ceiling price under Phase IV. Under the program, further increases were to be limited only to those necessary to cover cost increases incurred during 1973.

During the last half of 1973, as the foreign price climbed to 42 cents per pound, the United States became a net exporter of aluminum for the first time since 1970. In December the Cost

of Living Council permitted a 16-percent increase—from 25 to 29 cents per pound—in the base price of primary ingot. The Council acknowledged that the action was necessary to encourage the expansion of domestic capacity and reduce the differential between foreign and domestic prices. In short, the Council moved to let the aluminum price rise to alleviate domestic shortages.

THE FUTURE IN TERMS OF EXHAUSTIBLE RAW MATERIALS

It might appear that some necessary resources are going to be exhausted, given our current rate of consumption. But in a competitive market the incentives would more likely insure the development of substitutes or conservation of presently available resources. If the demand for nonreproducible resources increases—as is being generally forecast—the market-clearing price for the resources will very likely increase.

Price appreciation of scarce resources will feed back on the production costs of final products using such material. A rising price of one final product relative to another gives consumers an incentive to cut back on their use of the good becoming more expensive. Producers of the good becoming relatively dear may then find it more profitable to develop new production technology using substitute raw materials.

Suppliers of raw materials that are becoming more expensive have the incentive to search for and develop additional sources of these materials. It is possible that some locations—identified by geologists but previously too costly to work—will now be tapped because the higher price makes them profitable (see Box 3). The development effort may also generate technological breakthroughs in the process of mining the raw material and even in geological efforts to discover the location of resource deposits.

Private ownership is important to the conservation of resources. Suppose a firm has private rights to land containing some raw material; expectations that the price of that resource will rise rapidly in the future provide an incentive to con-

serve it.⁶ In a sense, the company can save by holding stores of this commodity rather than dollars. As long as the expected rate of growth in the value of this commodity exceeds *the interest rate* plus any costs of holding this resource, the commodity is worth more undeveloped than developed. Under these conditions, if the owner develops the resource, sells it, and buys investment securities at the existing rate of interest, he will have less money than if he waits a year before developing and selling it. As such then, the market-clearing price and expectations about its movement can stimulate conservation as well as more rapid development of resources, depending on the direction of expected movements. This scenario also highlights the importance of the level of the interest rate in determining the conservation of raw materials—and it suggests a potential danger in regulating interest rates over any long period.⁷

THE CLAMOR FOR GOVERNMENT ACTION

What about the poor? Some people favor price controls—regardless of the shortages caused—because they claim that the poor are “unfairly” squeezed out in the distribution of commodities by “high prices.” Others might argue that controls would be necessary in times of natural disasters to insure distribution of goods to the affected parties. Still others would point to their need during wartime to insure the allocation of

⁶Establishing ownership is an important ingredient in finding the best *method and level* of conservation for our raw materials. It is not the fact that a resource has economic value that leads to its depletion, but more important how it is owned. For example, fish and beefsteak both have economic value, but the stock of New England coastal fish is being depleted while cattle survive. The fish are owned by “everyone,” while cattle are owned by individuals (or agents of the individuals) who have the right to keep others from slaughtering them. Hence, they can capture the value at some time in the future, which cannot be assured under common ownership.

⁷To some this may seem a far-out connection between the financial markets and conservation of resources, but as long as financial securities are alternative investments to holding real assets the connection exists.

BOX 3

PROJECTING RESOURCE DEMAND AND RESERVES

Since World War II, a number of technical studies have made projections about future resource usage and attempted to quantify the amount of raw materials available in the United States and the world.* In doing this, the analysts have had to forecast and incorporate the effects of growth, technological innovations, and changes in consumer preferences. These forces of change will alter the market-clearing price of a resource relative to its substitutes. It is this relative price which is crucial to the production and consumption decisions made everyday.

Taking present studies as the starting point, it might be useful to examine how they project future demand and arrive at a concept of reserves. As an example, consider the 1973 report compiled by the National Commission on Materials Policy. The demand until the year 2000 is estimated to repeat the growth experienced from 1950 through 1970. The cumulative demand 1971–2000 is calculated by adding up the consumption in each year. This technique ignores the effects of new movements in relative prices simply because these shifts were judged too difficult to estimate; as such, this is reason to doubt the accuracy of the estimated demand.

To set a framework for discussion of nonreproducible raw material supplies, the study defines the amount listed as *reserves* as that quantity known to be available using processes less costly than the current open market price. These reserves are available without any new price changes or technological breakthroughs. However, there are some quantities, call them *identified resources*, which are essentially well known as to location, extent, and grade, but too costly to mine presently. Presumably these resources will be exploitable in the future under changed economic conditions or with improvements in technology. For each commodity, there may be a third classification of quantities undiscovered but predictable according to accepted geological knowledge. Call this third group *hypothetical resources*.

To understand some of the implications of these data, assume there exists some hypothetical commodity, RAMAT. This hypothetical material is typical of those commodities whose cumulative demand projection substantially exceeds their current reserves, say the average of those in the Table. This average ratio of probable cumulative demand to reserves of these resources is 5.2. At first glance, we would expect to run out of RAMAT before the end of the current decade. However, as the reserves are used up, suppliers will find themselves able to raise prices to allocate dwindling supplies over future years. As the open market price of RAMAT rises, demanders will cut back on their quantity demanded and suppliers will find it in their interests to bring forth some of the identified resources and even to explore more of the hypothesized resources. Depending on the size of the identified reserves, their costs of recovery and the findings from further exploration, a shortage at 1971 prices could turn into abundance at 1980 prices.

*See the following resource comparisons with expected consumption in J. Frederic Dewhurst and Associates, *America's Needs and Resources*. Twentieth Century Fund Report 1947; *Resources for Freedom*, Report of the President's Materials Policy Commission (Washington: Government Printing Office, 1952); Hans H. Landsberg et al., *Resources in America's Future* (Baltimore: Johns Hopkins Press, 1963); *Material Needs and the Environment Today and Tomorrow*, Final Report of the National Commission on Materials Policy (Washington: Government Printing Office, 1973).

RESERVES AT CURRENT PRICES DO NOT TELL THE WHOLE STORY

(A)	(B)	(C)	(D)	(C/D)	(E)	(F)
Commodity	Units ¹	Probable Cumulative Demand 1971-2000 ²	U.S. Reserves at 1971 Prices ²	Demand Relative to Reserves	Identified Resources	Hypothetical Resources
Aluminum	Million S. T.	370	13	28.5	Very Large	KDI ³
Antimony	Thousand S. T.	822	110	7.5	Small	Small
Asbestos	Million S. T.	43	9	4.8	Small	Insignificant
Barium	Million S. T.	31	45	.7	Very Large	Very Large
Beryllium	Thousand S. T.	28	28	1.0	Very Large	Huge
Boron	Million S. T.	5	40	.1	Very Large	Huge
Bromine	Billion lb.	12	17	.7	Huge	Huge
Copper	Million S. T.	93	81	1.1	Large	Large
Feldspar	Million L. T.	38	500	.08	Huge	Huge
Fluorine	Million S. T.	39	6	6.5	Small	Small
Gold	Million tr. oz.	293	82	3.6	Large	KDI ³
Gypsum	Million S. T.	726	350	2.1	Huge	Huge
Iodine	Million lb.	269	225	1.2	Very Large	Huge
Iron	Billion S. T.	3	2	1.5	Very Large	Huge
Lead	Million S. T.	34	17	2.0	Large	Moderate
Lithium	Thousand S. T.	183	2,767	.07	Huge	Huge
Mercury	Thousand flasks	1,730	75	23.1	Small	KDI ³
Molybdenum	Billion lb.	3	6	.5	Huge	Huge
Natural Gas	Trillion cu. ft.	1,098	279	3.9	Moderate	Large
Petroleum	Billion bbls.	276	38	7.3	Large	Large
Phosphorus	Million S. T.	208	39	5.3	Very Large	Huge
Planinum	Million tr. oz.	16	1	16.0	Moderate	Large
Potassium	Million S. T.	216	50	4.3	Very Large	Huge
Silver	Million tr. oz.	4,400	1,300	3.4	Moderate	Large
Sulfur	Million L. T.	514	75	6.9	Huge	Huge
Talc	Million S. T.	52	150	.3	Very Large	Huge
Tungsten	Million lb.	1,000	175	5.7	Moderate	Moderate
Uranium	Thousand S. T.	1,240	130	9.5	Large	Large
Zinc	Million S. T.	62	30	2.0	Very Large	Very Large

¹S. T. = Short Tons, L. T. = Long Tons, lb. = pounds, tr. oz. = troy ounces, kg. = kilograms, bbls. = 42 gals.

²As estimated by U. S. Bureau of Mines, 1973.

³Known data insufficient.

Source: *Material Needs and the Environment: Today and Tomorrow*. Final Report of the National Commission on Materials Policy (Washington: Government Printing Office, 1973), pp. 4B-8 to 4B-9.

resources to the national effort and not some profitable venture which appears not to assist in winning the war.

It is true that prices discriminate according to the ability to pay. Not that the rich will consume all commodities, but with their superior ability to pay they will probably end up with more of the available goods and services. If society wants to change this distribution, there are more efficient methods than Federal price controls. First, it is not clear that the poor will be better off in the longer run when a nonprice allocation scheme is substituted for price rises.⁸ Second, price controls shrink the size of the total "pie" of goods and services available by hamstringing the incentive necessary to increase output by suppliers.⁹ An "unsatisfactory" distribution of income could be better solved by using government as a vehicle to tax the nonpoor and give income to the poor through transfer payments. This would save the efficient product-allocation scheme and allow society to see more explicitly the costs of accomplishing this social goal.

During times of natural disasters, people may be more willing to sacrifice personal wealth to the common good of helping those caught in the disaster. Thus, a democratic government might be used as a vehicle to marshal the personal resources of the "unaffected" and distribute them to the "affected." However, attempts to hold down prices for the benefit of those less able to pay will encourage everyone to consume more of available goods. Also the incentive to produce more—usually desirable at such times—will be stifled as low prices hold down the

profit incentive.¹⁰

During wartime every citizen is supposed to pay the price of victory through the personal sacrifices asked by government. However, it would be wise for government to avoid institutions which are inefficient and hinder the incentives to increase productivity and conserve in consumption. Price controls are such an institution. It would be better for government to bid away from other uses the resources needed to win the war. The resulting increases in income to suppliers of equipment (and manpower) would provide incentives for them to heighten their efforts. Rising prices for material and labor would also encourage conservation of resources in nonwar endeavors. If any changes in the resulting distribution of income were desirable, this could be handled through income taxes.

NECESSARY EVIL? NOT UNLESS PRICES ARE STRIPPED OF THEIR POWER

The future of shortages depends largely on the application of price controls. Calls for such controls depend on the citizenry and their understanding of the costs and benefits of such actions. Fortunately, continued regulation of prices by government fiat is not a certainty. When forced to choose between shortages and price rises, it is not clear that the consumer will choose the former. Some shoppers would prefer to pay 60 cents for a gallon of gasoline rather than not being able to buy gas if the price were set at 35 cents per gallon.

Relative prices—the price of one good as compared to all other goods—are a powerful tool in the markets' attempts to balance future demand and future supplies as well as current quantities. As such, they generate incentives that affect production of desirable goods and the

⁸For a discussion of this in terms of rental housing, see Howard Keen, Jr. and Donald L. Raiff, "Rent Controls: Panacea, Placebo, or Problem Child?" *Business Review of the Federal Reserve Bank of Philadelphia*, January 1974, pp. 3–11.

⁹The goal could be just the opposite—enlarging the output available for distribution. Investment in productive education and machinery enlarges the economy's ability to produce and for this reason some people are urging government to provide investment tax credits.

¹⁰For a reconstruction of the housing market after the San Francisco earthquake of 1906 and discussion of the necessary role of prices in such markets, see Milton Friedman and George J. Stigler, *Roofs or Ceilings? The Current Housing Problem* (Irvington-on-Hudson, N.Y.: Foundation for Economic Education, 1946).

conservation of scarce resources. It would be better to harness these motives to help accomplish social objectives than ignore their exis-

tence and appear indignant when they throttle well-intentioned efforts by government.



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