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THE ENERGY CRISIS AND MACROECONOMIC POLICY

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**THE ENERGY CRISIS AND  
MACROECONOMIC POLICY**

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It is hard to find an issue more confusing than energy policy. Is there a shortage of oil? Why? How long will the shortages last? Who's to blame? What will be the supply and demand response to price decontrol? What are the appropriate policy responses today? Can the President or the Secretary of Energy or the Congress be trusted to find the answers? And so on.

I should tell you at the beginning that I do not have the answers. Only a fool would pretend to. Rather, I would like to offer up to you four simple and perhaps obvious points regarding energy policy and economic policy. First, energy policy has graduated from a microeconomic to a macroeconomic issue; it is hopelessly enmeshed in all of our major economic problems. Second, when this first point is recognized, we see that the overall economic costs of energy--especially oil--consumption are way above what buyers face on markets; we are still underpricing energy. Third, I will argue that the whole experiment in politicization of energy policy--prices and consumption--has been a serious failure. We have concentrated too much on substance and too little on process. And, finally, as a result of all these three points, I will make some suggestions about the directions we should follow in energy policy.

#### 1. The macroeconomic perspective

Up till 1973, energy and oil economics were a minor branch of industrial organization. A couple of years ago, it was hopeless trying to convince people we had an energy problem. Today energy stands as one of the central constraints of macroeconomic policy. What happened? It is useful to recapitulate briefly.

Upon assuming office 28 months ago, the Carter Administration faced an economic situation that was, by today's standards, idyllic. Inflation had fallen markedly from its 1974 peak and the economy was growing strongly with ample slack. The world economy was beginning to recover from the oil shock. Energy markets showed a glut. The dollar was strong and stable--reflecting a strong external position.

The speed of Fortune's reversal was stunning. The resources of the economy today stand fully utilized, perhaps overly so, and the recession keeps retreating over the horizon. So do the improvements in our trade and current account balances, which leads to great jitters on foreign exchange markets. By any inflationary standard--actual, core, or underlying rate--we have witnessed a sharp acceleration. The spectre of oil shortages and upward price spirals for the indefinite future await us.

In short, the United States economy is fundamentally constrained on four fronts--by real resources, by inflation, by energy, and by our balance of payments position. Each of these constraints must be weighed in any major economic decision--like fiscal or monetary policy, oil pricing, or foreign exchange market intervention.

Energy policy is so complicated today because any important decision affects in a vital way each of the four constraints that we mentioned above. Even here we oversimplify, for we omit the complication of foreign policy, particularly concerns about stability in the mideast.

What are the macroeconomic connections? It is clear that we are facing a global constraint on oil production today. The "shortfall" at OPEC's official price appears to be only in the order of 1 to 2 million barrels per day (2 to 3 percent of global oil consumption), but the microscopic price elasticities are driving open market (spot) prices by a factor of 50 to 100 percent above the official price.

The new twist is that the global shortfall appears to be one that has no obvious happy solution in the next few years. Projections of oil available to industrial countries indicate a stable or declining trend to the mid-1980s. If these projections are right, then there are only three ways for us to stay within the energy constraint: to slow economic growth, to allow a rapid escalation in real oil prices, or to induce rapid non-price conservation by regulation, harassment, or rationing.

We see quickly, then, why energy policy spills over to affect other macroeconomic constraints. If we slow the economy so that energy demand slows to accommodate supply, we idle enormous amounts of plant and labor. Given the low demand elasticities if we allow oil prices to rise so that the normal market forces do their work, we exacerbate an intolerable inflation problem. If we use rationing or other regulatory devices, we strain a political system that is clearly unable to cope with the present burden. And pervading all these policies is the reality that higher OPEC prices increase our imports, force us to pay more tribute to OPEC, and lead to a declining dollar.

## 2. The macroeconomic cost of oil

Given this enormous degree of complexity and interaction, is there any guiding principle we can use to help us sort out the impact of oil on overall economic performance? A useful perspective is to ask, what is the true social or macroeconomic cost of higher energy consumption, and how does this compare with the price market participants face?

I believe that, from the vantage point of the U. S. economy, the social costs of oil consumption today are very high--far higher than we have acknowledged as a nation. The social costs are high because as we consume additional oil we bump harder into each of the macroeconomic constraints mentioned above. When these realistic features are added up, the price of oil consumption is astronomical.

1. Constraint number one is that we have a fully employed economy. Thus when we increase oil consumption, this directly leads to an increase in imported oil. Eventually, we pay for this in exports of goods and services. Given that our economy is fully employed this implies that, at today's prices, an additional barrel will cost us \$16 in real resources available for domestic use.

2. Constraint number two is the global oil supply limit. We must take into account that an additional unit of oil demand (technically, a shift in the demand function) of one barrel is likely to bump into the global oil supply constraint. Assuming oil supply is given, the effect of an additional unit demand will be to induce higher oil prices until demand is choked off--just what appears to be happening now. This leads to more tribute money draining out of the economy.

The exact figure here is clearly a treacherous calculation, as it

depends both on macroeconomic policy and price elasticity of demand for oil. It can be shown that the additional cost in such a circumstance, in a static world, is equal to the original price divided by the absolute value of the demand elasticity. Thus if the price-elasticity is one-half, buying an additional barrel of oil will result in all other consumers paying a total of about 4 billionths of a penny per gallon for a total of \$32 across all consumers, or about \$10 a barrel for the United States.

The estimate of the overall effect of the oil supply constraint varies in different models from a few pennies per barrel in very long run equilibrium models with no production constraints to around \$25 a barrel for short-run models with very low demand elasticities. My inclination would be toward the middle of this range.

3. A third macroeconomic linkage concerns the effects on our balance of payments. To the extent that higher expenditures on oil imports do not get spent on American goods, our balance of payments position deteriorates. In recent years, the U. S. has captured less than 1/4 of OPEC imports. Because our balance of payments is constrained, the higher trade deficit following on higher oil consumption leads to a lower dollar and a loss in real income from a deterioration in our terms of trade. It should be noted that only the first round of expenditures (point 1 above) is likely to lead to a relative deterioration of the U.S. external position. As the U.S. share in oil imports is approximately the same as its share of trade, an induced oil price increase (point 2 above) will be shared by all countries, and we will not suffer a further deterioration in our balance of payments.

How significant is the balance of payments impact likely to be? Using the results from standard econometric models of the foreign trade sector of the U.S., the additional loss in real income is likely to add one-half to the cost of oil in point 1 above. Thus the terms of trade costs are approximately \$8 per barrel.

4. We must finally consider our inflationary predicament. As noted above, because of the energy constraint and the balance of payments constraint, higher oil consumption will lead to a significant increase in oil prices and to a drop in the dollar--both of which generate inflationary pressures. Because we are inflation constrained, monetary and fiscal authorities are likely to react by a further tightening of policy so as to restrain these pressures.

Here again, quantification is treacherous because of the uncertainty about the reaction of policy or disagreements about the effectiveness of macroeconomic policy. If policymakers decide to accommodate all the inflationary impulses--thereby leaving real output and unemployment unaffected by higher prices--then steps 1 to 3 above capture all the real income losses. Complete accommodation seems ill-advised and unlikely. At the other extreme, no accommodation of inflation, policymakers would induce sufficient slack to choke off the oil-induced inflation. In this case, the foregone output due to points 2 and 3 above will be increased by \$2 to \$10 per barrel.

The calculations are collected in the accompanying table. They are illustrative and have a significant margin of error because of inherent uncertainties about the economy and policy. The total social cost to the U.S. of an additional barrel of oil consumed today is estimated to lie between \$24 and \$58. Given that in early 1979 the average cost was about \$13, this indicates that the nation as a whole was paying from \$9 to \$45 more than market participants. This premium constitutes a very large "externality" that must be taken into account when considering energy policy.



Illustrative Estimates of Social Costsof incremental oil consumption (per barrel)

1. Direct resource costs	\$16
2. Energy constraint	Fractions of a dollar to \$25
3. Balance of payments constraint	\$8
4. Inflation constraint	\$2 to \$10
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Total Social cost	\$26 to \$59
Less: private cost (early 1979)	\$13
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Social cost above that paid by direct purchasers	\$10 to \$46

Source: See Technical Appendix

### 3. Policy responses 1973-79

From now on I will take as given that oil has become a significant constraint on short-run economic activity, and that the social cost of oil consumption is well above world market prices. How has our political system responded? Our inability to take steps commensurate with the gravity of the problem is a national embarrassment. Year after year, the American people think they are being hoodwinked. Year after year, Congress attempts to keep oil prices down. A review of major energy legislation over the last five years will find more that impedes than promotes adjustment.

More generally, we have witnessed over the past five years a drastic experiment in politicizing major decisions in the energy market. Allocation and technological decisions are increasingly being taken in Washington rather than in the marketplace. Two thirds of domestic oil is priced by regulation. More than half of oil products are allocated by government regulation. Exports of Alaskan oil are forbidden by statutes, leading to significantly lower Alaskan production. The fate of virtually all major new energy technologies--the breeder reactor, shale oil, advanced coal cycles--is determined by Federal budget forces rather than by entrepreneurs putting their money where their mouth is. The energy efficiencies of major energy-using products--automobiles, appliances, and houses--are increasingly determined by government regulation. The choice of fuels in electricity generation is circumscribed by statute. At times the visible hand of government is so heavy--as in the Alaskan or Sohio pipelines--that statutes are necessary to circumvent government rules.

Most have strong feelings about this politization of the energy sector--some feel it has gone too far, others not far enough. I would

certainly not argue that every piece of energy and environmental legislation should be repealed. Rather, the problem is that, once we started down this road, we were a little like the little boy asked to spell banana-- He said, "I know how to do it but I don't know when to stop." Whatever else can be said, one thing is absolutely clear--we are importing 35% more oil today than we were in 1973. In other words, this whole experiment in outsmarting the market has not worked.

I see three reasons for the failure of energy policy. The first is obvious--we have suppressed the price of energy and boosted consumption. For example, the real price of gasoline in 1978 was only 12 percent higher than 1973--no wonder gasoline consumption rose 11 percent. The real price of oil and gas used in residential and commercial establishments rose only 10 percent from 1973 to 1978. Small wonder consumption rose 8 percent. Only in industry did significant price increases--and major consumption cuts--occur.

The second reason is less obvious. We have probably so confused private decisionmakers that they have channeled their ingenuity in other directions. Since 1973, productivity in mining plummeted, as did that in utilities. The regulatory signals change almost daily, and energy legislation changes the economic framework every year. One wonders how an energy firm could find its way through the shifting winds. Such a predicament was a concern Madison expressed 200 years ago: "It will be of little avail to the people that the laws are made by men of their own choice, if the laws be so voluminous that they cannot be read, or so incoherent that they cannot be understood, or undergo such incessant change that no man who knows what the law is today can guess what it will be tomorrow!"

The third reason is the most critical. By politicization of the energy sector, and transferring the locus of substantive detailed decision-making to Washington, we have created a process which, ironically, cannot resolve substantive issues. For example, I suggested earlier that there are three and only three solutions to today's shortage--rationing, higher oil prices, and slower economic growth. Congress has voted down the first, the Democratic caucus voted against the second by almost 2 to 1, and the third wouldn't last an hour. The delicate fabric of social consensus is stretched too thin if asked to cover the detailed pricing and allocation decisions of the energy market.

Let me put the point differently. Most energy experts are convinced that in the long-run, the U.S. has the resources and knowhow to develop alternative sources at prices close to today's. But we don't know which technologies are the best or how to pursue them. The question we must focus on is how we can make the transition as swiftly as possible. I am convinced that it is critical that the market participants must feel that they can move and not be undermined by the vagaries of the Congress or the DOE. The only process which we know will eventually solve this problem is a market; what we are doing now is generating such uncertainty that we are probably slowing market adjustment in developing new technology.

#### 4. Where do we go from here?

I have suggested that the macroeconomic costs of oil consumption are enormous and that the institutions we have created to deal with the problem a failure. Are there any steps to take to improve it?

First, it seems clear to me that decontrol of the oil market--prices and allocations--is the first and absolutely essential prerequisite to better policy. This will have significant effects on the economy, particularly on inflation. But if my analysis is correct, even in a static framework, the benefits of reducing real resource cost and OPEC tribute money outweigh the inflationary costs.

Indeed, the short-run gains to the economy from decontrol will be even greater than indicated above. Because of the absence of a policy today, we are burning up valuable fuel and time in nuisance rationing. It is hard to dream up a more inefficient policy. In the long run, a decontrolled market will allow the transition to new sources to proceed in an orderly way, based on economic rather than political calculus.

Second, we must begin to recognize that politicians can set up processes better than prices. Congress is full of lawyers, not engineers. The decontrol of the oil market would be a modest but important step in restoring to its appropriate place and legitimacy the market's role in allocating scarce goods. If this could be followed by further depoliticization of the market, there could be large benefits. We should consider, for example, a modest proposal, such as repeal of the prohibition of export of Alaskan oil or some radical proposals for substituting market-type devices in the environmental area. If we desire to speed development of new technologies, then generalized tax incentives--which enhance the even handedness and predictability of the political system--should be used.

I will press my luck and go on to a third point. If we got this far I should be happy. But I cannot avoid thinking that, once decontrol were behind us, the enormous gap between the market price and the macroeconomic cost of oil should be narrowed. We would gain enormously if we would preempt OPEC by raising oil prices above their market levels ourselves.

There are many ways to bring prices closer to social costs. If the United States were to act unilaterally, an import fee or auctionable quota on oil would use the process of a market mechanism to "internalize" the macroeconomic externalities. An even better tool would be for the industrial countries (say the OECD region) to place an external tariff of \$5 to \$10 per barrel on all oil imported into the region. This would have a more powerful effect than if the U. S. acted alone, and it would also avoid the distortionary trade effects.

This third point is probably utopian, and perhaps should be reserved for next year. This year's work is simple: we should convince the American people that "Yes, Virginia, there is a real oil shortage," and making sure that oil price decontrol does not get torpedoed. If we did those two things, it would be a good year's work.

Technical Appendix

The calculations underlying the illustrative social cost calculations in the table on page 7 are drawn from a wide variety of sources rather than from a single model.

1. Direct resource costs are an estimate of the landed cost of crude oil in May 1979.

2. The estimates of the effect of additional consumption on oil price is drawn from a number of models of the energy sector. Long run competitive or monopoly equilibrium models (such as in W. Nordhaus, *The Efficient Use of Energy Resources*, forthcoming, 1979, or unpublished work by Steve Salant) yield estimates of less than \$1 per barrel of social cost. Short-run models in which both supply and demand are highly price inelastic yield a much higher figure. For example, a 0.2 price-elasticity of demand and inelastic supply implies that each barrel of incremental demand costs all consumers \$80 per barrel.

3. The estimate of the terms of trade loss assumes that the dollar exchange rate changes sufficiently so that the present value of the current account balance is unchanged. Parameter estimates are drawn from various published and unpublished studies of the effect of exchange rate changes on the current account. The basic assumption is that a one percent dollar depreciation leads to an improvement in the current account balance of \$2.4 billion. Note that the terms of trade loss refers only to the direct resource cost, as the effect of higher oil prices is assumed to have a symmetrical effect on the dollar-bloc and non-dollar-bloc countries.

4. A policy of "complete accommodation to inflation" assumes that there is no effect on output or employment of higher oil prices and the lower dollar. "No accommodation" assumes that the inflationary effect of higher oil prices and the dollar is completely offset by macroeconomic slack. The cost of lowering inflation by slack is assumed to be \$100 billion of real output per point deceleration of inflation.