

DALLAS FEED

Economic Review

Federal Reserve Bank of Dallas
March 1982

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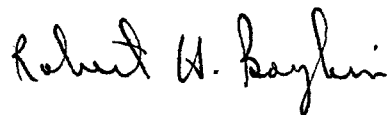
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This document, the *Economic Review*, will be published every other month initially and may be published more frequently at a future date. It will contain, for the most part, analytical articles on economic and financial matters, ranging in scope from international finance to regional developments.

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You have already received a copy of *Roundup*. This newsletter will focus on operational and regulatory developments, as well as other items of interest to the constituency of the Federal Reserve Bank of Dallas, particularly those utilizing our services.



Robert H. Boykin
President

How Contagious Is “Dutch Disease”?

By Leroy O. Laney*

Is a country's possession of energy resources an unmixed blessing? Over the past decade, sharply higher prices have stimulated energy development in countries that previously were not major producers. While this development has added to world energy supplies and prevented cartel-determined prices from rising higher than otherwise, it has also created problems for the countries involved. In retrospect, countries possessing oil and gas reserves probably judge themselves to be better off than those without the resources, but a developing energy sector also imposes costs.

Into the vernacular of economists has come the term “Dutch disease,” from the Netherlands experience as a net energy exporter. In general, both real economic activity and balance-of-payments flows can be distorted toward the energy sector, and the exchange rate can be subject to what many would consider an artificial buoyancy. Higher oil prices and the associated revenues have affected members of the Organization of Petroleum Exporting Countries (OPEC), of course, but “Dutch

disease” has typically been applied to economies in a somewhat higher stage of development.

After outlining characteristics of the affliction and the ways in which it can be manifested, this article will look at three economies that have it in one form or another: the United Kingdom, Norway, and Mexico. There are both similarities and differences. While the stage of economic development, the structure of the balance of payments, and the exchange rate regime are at least somewhat different for each, all three economies have felt the impact of the energy sector in recent years. Common factors are a higher value for the exchange rate than would otherwise be the case and a squeeze on nonenergy sectors of the economy.

Symptoms

It is convenient to begin with the general impact of energy developments on exchange rates, which can be substantial. An intimate acquaintance with foreign exchange markets is not essential to appreciate that oil price escalations will affect the various major traded currencies differently. Other things equal, for example, announcement of a price hike can be expected to weaken the yen, since Japan imports practically all its energy, and to

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strengthen the U.K. pound, because the United Kingdom has North Sea oil sources. The U.S. dollar may rise or fall, depending on whether the U.S. share of world oil imports is smaller or larger than the flow of assets from oil-producing countries into U.S. dollars. (In the long run, as the transfer of real resources from oil-consuming to oil-producing countries occurs, the effect can also depend on the U.S. share of world oil imports relative to the share of exports from the United States to oil-producing countries.) The 1981 oil glut, with its softer prices, generally weakened the so-called oil currencies.

A developing energy sector can produce both real and financial dislocations. Rising oil prices stimulate shifts in the allocation of real resources. These shifts can result in the emergence of idle capacity in the nonenergy sector while excess demand is present in the energy sector. Financial effects can occur through attempts to forestall the shifts by expansionary monetary policy. This accommodates the rising prices and causes general inflation. In addition, a strong exchange rate can feed back to the real economy and magnify the rise in dependence on the energy sector.

At first, it may seem ironic that the possession of oil resources by a country can actually have detrimental effects, but a strong exchange rate can make nonoil exports less attractive in competitive world markets. Oil exports then become more important in the trade account of the balance of payments. In a country for which exports are large relative to domestic activity, this importance can lead to a less diversified overall economy. And as the oil sector becomes larger, imports can be dominated by inputs to it. (It has been argued, however, that Dutch disease is only a transitional phenomenon in a long-run context, since oil resources generate permanent income effects lasting beyond the life of oil reserves.)

All problems may not end when an oil glut occurs, such as the one that began in 1981. There may, of course, be some downward pressure on the exchange rate deriving from a weakness in oil prices and lower revenues, and this may bring some relief to the tradable goods sector of the economy. But the heightened dependence on the energy sector can make the economy's health sensitive to oil prices, and alternative exports may be difficult to bring on line quickly. The country can become vulnerable in the same way any one-product

economy does when world demand weakens for that product. If the exchange rate is being heavily managed during this period, the diminution of foreign capital flows that previously were forthcoming on the prospect of high oil revenues may increase downward pressure on the exchange rate.

With respect to the balance-of-payments accounts and internal sectors of the economy, it is useful to outline the possible effects of Dutch disease with two equations:

$$(1) Y = T + NT + E,$$

and

$$(2) X - M + C = \Delta R.$$

Equation 1 breaks domestic economic activity Y into a tradable goods sector T , a nontradable goods sector NT , and an energy sector E . The tradable goods sector consists of exportable and importable items that typically enter international trade, while the nontradables sector comprises those items that do not. One manifestation of Dutch disease is a squeeze on output and employment in the export sector and in the domestic sector competing with imports. The tradable goods sector is encroached upon by energy-related products and nontradables. If prices do not fall for nonoil exportables and domestically produced goods that compete with imports, upward pressure on the exchange rate can make it harder for a country's exports to compete in world markets and cheaper to substitute imports for items that could be produced domestically.

Equation 2 is simply a balance-of-payments equation setting exports X less imports M plus net capital inflows C equal to the change in international reserves R . Rising energy exports in X may initially increase total exports, putting upward pressure on the exchange rate, unless the increase is offset elsewhere in the balance-of-payments accounts. Imports may increase as the exchange rate rises because foreign products become cheaper relative to domestically produced substitutes. Imports of capital goods related to the energy sector may also swell M . To the extent that nonoil exports fall and total imports rise to offset oil export revenues, the upward pressure on the exchange rate is muted.

It is not likely, however, that this is all that will be happening. The existence of energy products in the export accounts may not be enough to produce a surplus in the overall trade account or current account. Foreign direct investment and financial

capital, at least some of it energy sector related, will cause capital inflows C to rise. The country is apt to find that these capital inflows make it much easier to finance an overall current-account deficit if one exists. And aside from infusions of foreign capital that are directly related to a developing energy sector, there may be a tendency for the international financial community to view the country as a better credit risk because of its known possession of energy resources. Even if the current account of its balance of payments is in deficit at the time, the prospects of energy self-sufficiency and future oil export revenues turning the deficit into a surplus are likely to be viewed favorably by foreign banks.

Should increased energy exports, nonoil exports, and capital inflows exceed imports and capital outflows on the left-hand side of equation 2, upward exchange rate pressure occurs. The monetary authorities may wish to resist appreciation of the currency in exchange markets, buying foreign currency and adding to international reserves R . Because such purchases enlarge the monetary base of the country—unless measures are taken to sterilize the official reserve acquisitions—there is an expansion of the money supply.

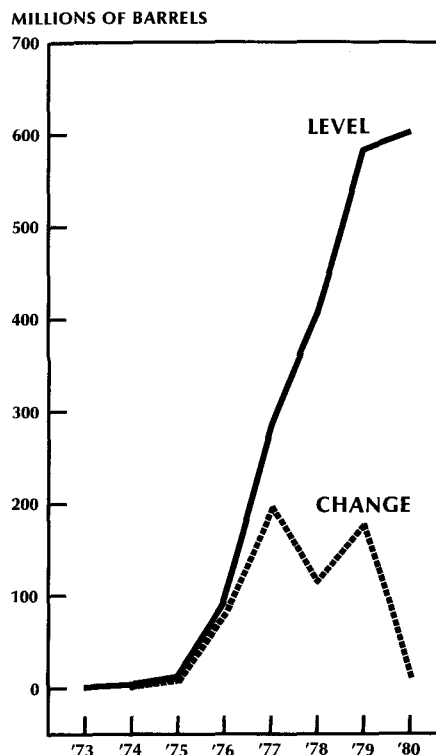
An increase in money validates wage pressure and other cost-push forces emanating originally from the energy sector, which leads to inflationary pressure elsewhere in the economy. As higher oil prices raise the demand for labor and, therefore, wages among suppliers to the oil industry, other firms must raise wages to keep workers. Large wage settlements in the oil sector trigger similarly large settlements in other sectors. Ultimately, inflation cannot occur unless wage-push pressure is accommodated by monetary policy. If it is not, unemployment rises temporarily in labor markets not able to support the wage increase. In the longer run, as relative wages adjust and some become downwardly flexible, there is a redistribution of income toward the energy sector.

United Kingdom

Among the currencies of countries considered here, the U.K. pound is traded in the deepest financial market and serves most often as a vehicle currency in the denomination of international trade transactions. It has floated independently of the U.S. dollar and other currencies since the inception of managed

CHART 1

United Kingdom:
Crude oil production began to accelerate in the late seventies



SOURCE: *Petroleum Economist*.

floating exchange rates in the early 1970's. Ironically, in the 1970's the pound relinquished its partial reserve currency role, one shared with the dollar throughout most of the postwar period. But late in the decade the currency was cast into the ranks of the world's hardest currencies again. At least part of this shift can be attributed to the discovery of North Sea oil, even though the United Kingdom initially was not a net oil exporter. The appreciation of sterling, however, eroded the competitiveness of British industry and probably exacerbated the recession in the United Kingdom.

Not all of the pound's strength in the years when North Sea oil production began to rise can be attributed to oil revenues. The move toward more restrictive monetary policy in 1976, with renewed

The U.K. Pound Before and After North Sea Oil Effects

Using a simple monetary approach to exchange rate determination, which views the exchange rate as the relative price of two national moneys determined by the demand for and supply of the two currencies,¹ one can derive a specification that can be tested against movement in the exchange rate of the U.K. pound for U.S. dollars.

Assuming money demand functions in the domestic country and foreign country, respectively, as:

$$(1) M/P = L(y, i)$$

and

$$(2) M^*/P^* = L(y^*, i^*),$$

where M and M^* are nominal quantities of money, P and P^* are national price levels, y and y^* are real incomes, and i and i^* are short-term interest rates, and assuming the purchasing power parity relationship:

$$(3) x = P/P^*,$$

one can solve for the exchange rate x (quoted in domestic currency per unit of foreign currency):

$$(4) x = [M \times L(y^*, i^*)] / [M^* \times L(y, i)].$$

Specifying a conventional money demand functional form (where e is the natural exponential base):

$$(5) L = y^{\alpha_2} e^{-\alpha_3 i},$$

1. For an explanation of this approach and a cataloging of its origins and antecedents, see John F. O. Bilson, "The Monetary Approach to the Exchange Rate: Some Empirical Evidence," *International Monetary Fund Staff Papers*, March 1978. For a recent survey of exchange rate determination and a critical comparison of the monetary approach with others, see Ronald I. McKinnon, "The Exchange Rate and Macroeconomic Policy: Changing Postwar Perceptions," *Journal of Economic Literature*, June 1981.

taking natural logarithms, assuming money demand parameters the same in both countries, and transposing terms, it is found that:

$$(6) \ln(x) = \ln(M/M^*) - \alpha_2 \ln(y/y^*) + \alpha_3 (i - i^*).$$

With the exchange rate quoted in foreign currency per unit of domestic currency, adding a constant term and testing in an unconstrained form whether the coefficient on the first independent variable is different from 1, the result is:

$$(7) \ln(x) = \alpha_0 - \alpha_1 \ln(M/M^*) + \alpha_2 \ln(y/y^*) - \alpha_3 (i - i^*).$$

The use of a short-run purchasing power parity condition has been defended by invoking the role of expectations of future price level movements, based on currently observed independent variables, and by treating the true price ratio as an unobserved variable—actually defined by the exchange rate—since conventional price indexes do not reflect market prices accurately. Worthy of note is that the sign on the interest rate differential term is the opposite of that suggested by the argument that higher interest rates appreciate the currency by attracting capital inflows.²

This specification can be tested using the exchange rate in U.S. dollars per pound, a ratio of narrow money stocks in the United Kingdom and the United States, a ratio of industrial production indexes in the two countries to proxy real economic activity, and the dif-

2. See John F. O. Bilson, "Recent Developments in Monetary Models of Exchange Rate Determination," *International Monetary Fund Staff Papers*, June 1979.

commitment by the new government in 1979, kept nominal yields high on sterling-denominated assets. It is likely, therefore, that the British currency appreciated for reasons not related to energy. (Likewise, the pound's weakness in 1981 did not derive entirely from the decline in oil prices. Other factors cited were fear of renewed inflation and concern over government ability to control public spending. But clearly the oil glut can be isolated as an important source, reducing the North Sea oil premium on sterling during the period.)

Interestingly, however, the appreciation in the British currency began about the time North Sea oil production started rising substantially, in 1977 (Chart 1). Monthly movements in the sterling ex-

change rate before that time are easy to explain with one paradigm of exchange rate determination made popular during the 1970's. But the forecasting ability of this approach breaks down completely during the latter part of the 1970's—the period during which the oil premium likely was attached to the exchange rate. On the other hand, the world oil price in this period becomes a significant determinant of the rate, although it was not significant before. (See the accompanying box.)

Norway

Unlike Britain, thinly populated Norway produces significantly more energy than it consumes. About half of domestic energy consumption at present is

ference in three-month Treasury bill rates in the United Kingdom and the United States.

The U.K. exchange rate until 1977 . . .

Fitting the specification to monthly data for the U.S. dollar/U.K. pound bilateral rate over the period from April 1973 to April 1977, the first four years after the final breakdown of fixed exchange rates,³ the following results are obtained:⁴

$$(8) \ln(x) = -1.38 - .77 \ln(M_{uk}/M_{us}) \\ (-4.29)^*(7.23)^* \\ + .72 \ln(y_{uk}/y_{us}) - .21 (i_{uk} - i_{us}) \\ (4.14)^* \quad (-5.12)^*$$

$$\bar{R}^2 = .96; DW = 2.15; \rho = .55.$$

Each independent variable is quite significant statistically with the correct sign, and the overall explanatory power of the equation is high.

3. Although the U.K. pound actually floated independently of the dollar the prior June, March 1973 is the date usually quoted as marking the advent of generalized floating for major currencies. The European Community joint float, which continued after this date, was participated in by the United Kingdom very briefly after its inception in 1972. The exact endpoint of the above interval is not crucial for results here.

4. Figures reported in parentheses are *t* statistics; * indicates significance at the 99-percent level, using a one-tail test that the variable is signed as hypothesized. \bar{R}^2 is the multiple correlation coefficient adjusted for degrees of freedom. DW is the Durbin-Watson autocorrelation test statistic. ρ is the first-order autocorrelation coefficient estimated from a Cochrane-Orcutt procedure to correct for serial correlation of residuals.

. . . and after oil became important

The forecasting ability of this equation in the post-sample period here is dismal, however, as indicated in Chart 2. When the equation is fitted to data for the post-sample period, May 1977 through February 1981, the basic independent variables are not significant with the correct sign. But when the world oil price P_o is added in log linear form, it is quite significant:

$$(9) \ln(x) = -.55 - .13 \ln(M_{uk}/M_{us}) \\ (-.87)(-.59) \\ + .04 \ln(y_{uk}/y_{us}) + .007 (i_{uk} - i_{us}) \\ (.26) \quad (2.02) \\ + .18 \ln(P_o) \\ (4.03)^*$$

$$\bar{R}^2 = .93; DW = 2.29; \rho = .81.$$

The added variable is not significant for the earlier interval. It is apparent that the price of oil became significant in explaining movements in the pound sterling exchange rate during 1977, when North Sea oil became important in the balance of payments of the United Kingdom. While oil may not have been the only factor in sterling overvaluation in the late 1970's, it was clearly an important one.

met by hydroelectricity. Norway has exploited its natural endowment of mountain lakes and waterfalls to the point that electricity consumption per capita is one of the highest in the world, about twice that of the United States. Even so, only about half of the country's exploitable water resources have been developed. Relatively inexpensive hydroelectric power has allowed heavy investment in energy-intensive industries.

The considerable offshore oil and gas resources of the North Sea, therefore, are available for export. Norway is a particularly open economy, since its external sector is large relative to the total economy. The domestic economy is developed in the manufacturing, services, and construction sec-

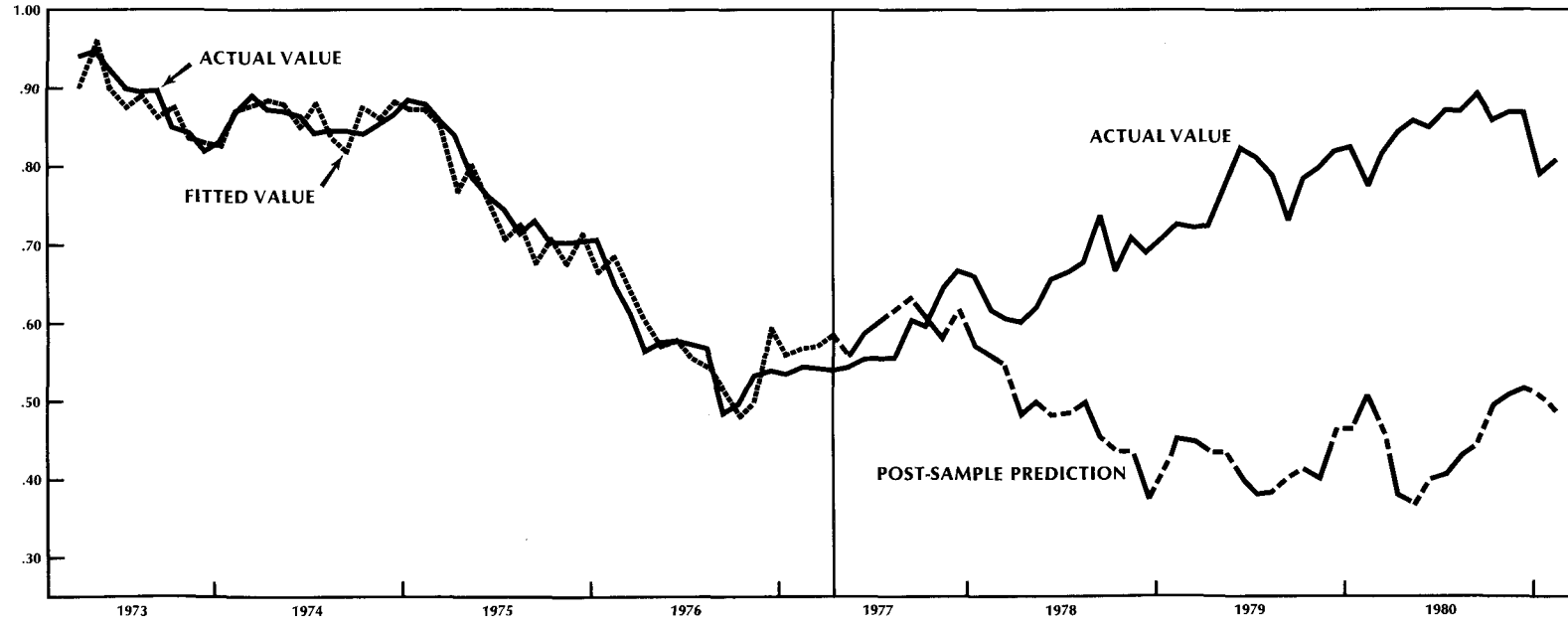
tors. With the introduction of a large and growing oil industry, the situation is rather different from some other oil-exporting countries. In a sense, Norway is similar to several OPEC countries; it can export petroleum at a rate many times its own consumption, and a population of only about 4 million means its propensity to import is low in relation to its oil revenues.

The expansion of the oil sector has created significant problems for the Norwegian domestic economy. Large wage gains in the oil industry have raised wages in other sectors. Overall inflation rose to about 14 percent in the first half of 1981. Cost increases have hurt the competitiveness of traditional industries, decreased exports of manufactured

CHART 2

A monetary approach explains the U.K. pound's exchange rate in an earlier interval but fails to predict movements after oil becomes a major factor

NATURAL LOGARITHM OF EXCHANGE RATE (U.S. DOLLARS PER U.K. POUND)



goods, and slowed overall economic activity. This has put political pressure on the government to provide subsidies to nonenergy sectors to keep Norway's relatively low unemployment rate from rising.

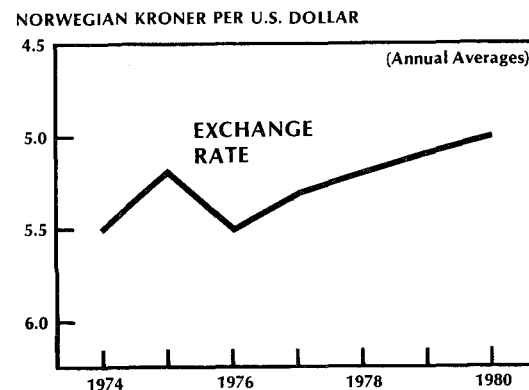
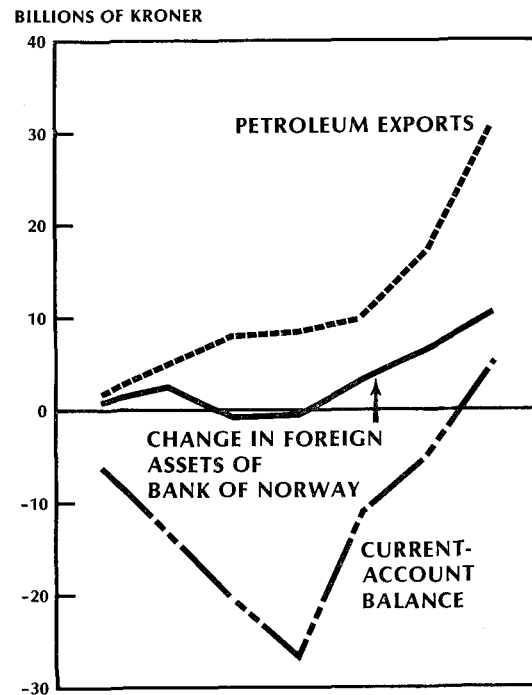
For some time, how to deal with oil and gas production has been an important issue in Norway. In the early 1970's, an annual ceiling on hydrocarbon production was set by the government. In 1974 the government borrowed heavily abroad in anticipation of future oil earnings. To compensate for the decline in exports brought on by worldwide recession, domestic demand was stimulated by government spending and subsidies to ailing industries. But with prolonged recession and the failure of oil revenues to materialize as expected, the expansionary policy gave rise to high balance-of-payments deficits (Chart 3).

In the late 1970's, however, increased oil exports were a major factor in moving the current account of the balance of payments from deficit toward a surplus. With the surge in oil exports, the krone also became something of an oil currency. Its appreciation negated temporary gains from two devaluations in 1978 and resulted in erosion of competitiveness of the country's manufactured goods. (With the 1981 weakness in oil prices, the krone was strong against some European currencies but fell against the U.S. dollar and various other currencies, relieving part of the pressure.) The Bank of Norway occasionally intervened heavily in foreign exchange markets, often to offset large krone demand by international oil companies for tax payments. Since official intervention swelled foreign exchange reserves, however, some have questioned the desirability of heavy exchange rate management. Resisting persistent appreciation of the currency can be a losing battle in the long run.

With an oil-induced current-account surplus, it has been suggested that one way the upward exchange rate pressure and unwanted acquisition of reserves can be avoided is for the country to export capital. A deficit on the private capital account of the balance of payments can offset the current-account surplus. The Norwegian commercial banking system, while not large on an international scale, can be made available to translate the surpluses into productive investment overseas.

CHART 3

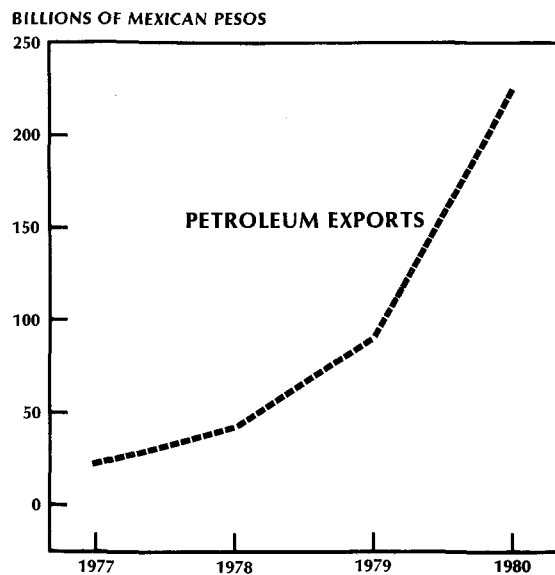
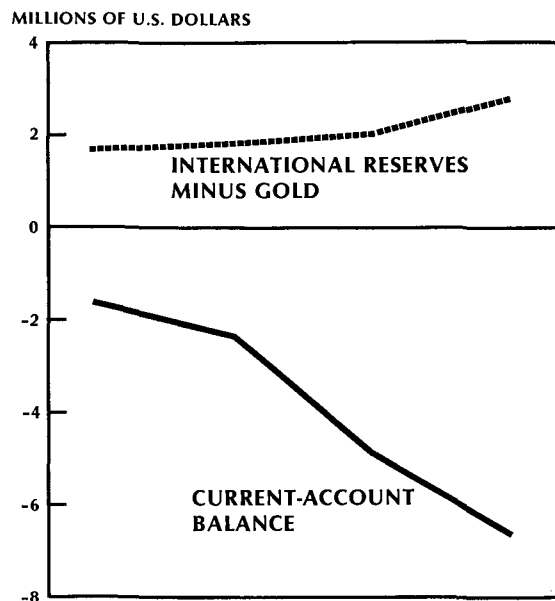
Norway:
Oil exports, international reserves,
the current-account balance,
and the exchange rate all rose
in the late seventies



SOURCES: International Monetary Fund.
Organisation for Economic Co-operation and Development.

CHART 4

Mexico:
While oil exports and international reserves rose in the late seventies, the current-account balance moved increasingly into deficit



SOURCES: Banco Nacional de Mexico.
International Monetary Fund.

Mexico

The impact of energy development on the Mexican economy is both similar to and different from the previous two cases. Mexico is less developed than a fully industrialized economy, and unlike Norway, a high proportion of energy production goes for domestic consumption. Another difference has been the nature of the exchange rate regime. The peso was held essentially stable with respect to the U.S. dollar beginning in early 1977, when the exchange rate was stabilized after the 1976 devaluation, in spite of the much higher inflation in Mexico. (However, a gradual depreciation at slowly accelerating rates has occurred since mid-1980. In February 1982 the Bank of Mexico ceased entirely its intervention in the foreign exchange market, and the peso fell abruptly.) The country also has run a chronic current-account deficit regardless of its oil exports, but the existence of its energy resources and the publicity given them in recent years have attracted ample external financing for this deficit.

The announced proved hydrocarbon reserves of what is now the world's fourth largest producer of oil swelled approximately eightfold from 1975 to 1980, and most petroleum experts foresee significant additions in the coming decade. The number of barrels of crude oil produced per day has grown almost as rapidly and is also projected to continue to grow. Predictions for growth of the petrochemical industry have been at least as high as for crude oil production. The United States has received the lion's share of Mexico's oil exports so far and may continue to absorb a large proportion in the future, but a concentrated effort has been made recently to diversify hydrocarbon export markets.

The national oil monopoly, Petroleos Mexicanos (Pemex), has become a richer and politically more potent public entity. The Mexican government owns a controlling interest in many of the country's major industries. Relative to the total for these decentralized state enterprises, Pemex budgetary allocations grew more than 30 percent from 1977 to 1980. This, among other things, has caused some shift in institutional lines of authority and political clout in the traditional polity structure. In recent years, Pemex has been the target of criticism from both the left and the right ends of Mexico's political spectrum. Charges have ranged from collusion with foreign interests to inefficiency and ineptitude in

energy development. These conflicts add to internal turmoil surrounding the country's emergence as a major energy producer.

Energy development may also have played a role indirectly in Mexico's decision to forgo its recent opportunity to participate in the General Agreement on Tariffs and Trade (GATT). Oil power possibly was believed sufficient to elicit better treatment from trading partners without having to undertake the trade reciprocity obligations implied by GATT and the economic adjustments it would require.

As is typical of Dutch disease, the energy sector has led economic growth at the expense of manufacturing and other sectors. From 1979 to 1980, the petroleum industry's contribution to the total gross domestic product of Mexico grew 17.5 percent. Production of crude oil, gas liquids, and condensates increased 32 percent in 1980, compared with gains of 12.8 percent in construction and 5.6 percent in manufacturing, which was down from 8.6 percent in 1979.

The balance of payments has reflected the increased role of the energy sector. In 1980, Pemex exports of crude oil, natural gas, and petroleum derivatives were over 67 percent of merchandise exports, compared with almost 44 percent in 1979. Pemex exports were about 41 percent of the overall Mexican current account in 1980. On the other hand, the value of Mexican agricultural, fishing, and livestock exports fell over 13 percent from 1979 to 1980. Manufactured exports grew almost 4 percent in value but fell in volume.

Another important current-account receipt item for Mexico, tourism, has also been weaker. Mexico's tourism balance fell almost 10 percent from 1979 to 1980. Foreign economic weakness was likely a contributing factor, but Mexican inflation relative to that abroad has discouraged incoming travelers and encouraged outgoing travelers. Mexican tourist expenditures abroad in 1980 were over 50 percent larger than in 1979, and the trend appears to have continued in 1981.

Mexico's imports have risen too, enough to drive the chronic current-account deficit further into the red in 1980 and 1981. The increase in imports has been spread widely across categories. In 1980, imports of intermediate and capital goods (largely for the oil industry) accounted for most of the value increase, while agricultural imports (partly necessitated by a drought) showed the largest

percentage increase.

An important factor in the decline in competitiveness of Mexican nonoil exports has been the increasing inflation rate. While real economic growth has been impressive—7.4 percent in 1980 and 8.0 percent in 1979—it has been stimulated by public sector expenditures. The resulting government deficit has put pressure on the central bank to provide financing. The narrow money supply, defined as peso currency and demand deposits, grew monthly at an average annual rate of 32.2 percent in 1980. A broader measure that includes U.S. dollar-denominated demand deposits and time deposits with maturities under one month grew at an average annual rate of 37.4 percent. The Mexican consumer price index was up almost 30 percent in the same year, compared with about 20 percent in 1979.

The peso/dollar bilateral exchange rate over time has not reflected the widening divergence between the price levels of Mexico and the United States.¹ There was some perceptible depreciation of the peso beginning about mid-1980. In 1981 the peso price of the dollar rose about 12 percent, and the rate of depreciation increased as the year progressed. The fall in the currency's value did not keep pace with the price level divergence after the 1976 peso devaluation, however. When official support for the peso was removed on February 18, 1982, the peso price of the dollar rose about 35 to 40 percent initially. Oil revenues have been a crucial factor in providing an underpinning to the exchange rate, since Mexico has been considered a relatively good credit risk by international lenders. Unlike other oil currencies, though, the peso never appreciated noticeably vis-a-vis the dollar or other currencies concurrent with oil crises or price hikes.

Conclusion

The countries surveyed here represent three current examples of Dutch disease. Obviously, however, the condition manifests itself differently in each case. It can surface whether or not a country is a net oil exporter, whether the country is highly industrialized or still developing, whether the overall current account or trade account is in surplus or deficit,

1. See Leroy O. Laney, "Oil, Inflation, and the Mexican Peso," *Voice of the Federal Reserve Bank of Dallas*, September 1979.

whether or not there is significant domestic consumption of energy relative to exports, and whether net overall pressure on the currency is upward or downward.

Dutch disease can manifest itself in different forms, depending on whether the exchange rate is free to float or relatively fixed, but the effects of upward pressure on the currency in magnifying the energy sector domestically and in making other exports less competitive are much the same. As in many other cases, countries that allow continuous adjustment in the exchange rate dictated by market forces may be better off in the long run than those that do not.

The Davis-Bacon Act: An Example of the Problems of Wage-Price Administration

By James G. Hoehn*

The Federal Government has a long-standing philosophy of paying its employees adequately. The civil service pay scale is based on wages and salaries paid by private employers. The Davis-Bacon Act, a special type of minimum wage law covering workers on federally financed construction projects, extends that philosophy to workers employed indirectly through contracts. Its purpose is to prevent contractors from paying substandard wages so they can profitably submit more competitive bids on construction projects financed, even if only partially, by the U.S. Government.

Such protection for construction workers cannot be achieved by establishing a single, nationwide minimum wage. Wages are generally higher in construction than in other industries. Furthermore, construction wages differ substantially across trades, areas, and types of projects. Under the Davis-Bacon Act the U.S. Department of Labor sets separate minimums for wages paid to each class of labor on each type of project in areas of the country where covered projects are, or will soon be, under way.

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The Department's staff determines these minimums by examining construction wages in the various localities. A basic premise of the law is that competitive bidding on Federal contracts would result in substandard wages in the absence of such protection. But this premise has no foundation in experience or theory.

The bill was introduced at a time when wages and employment were falling rapidly. Congressman Bacon, in supporting the bill's passage, cited examples of the awarding of Government construction contracts to out-of-town contractors who employed itinerant, low-wage laborers. At the time, however, the importation of cheap labor was neither a widespread practice nor an important cause of declining wages.¹ More recently, in cases in which wage protection has been ineffective because the minimums were substantially below prevailing rates,

1. The Treasury Department examined the number of itinerant laborers on 26 projects and found such workers common only in projects geographically isolated from large labor markets. See decision by J. R. McCarl, Comptroller General of the United States, January 10, 1931, in U.S. Congress, House, *Congressional Record*, 71st Cong., 3d sess., 1931, 74, pt. 7:6506.

wage cutting has not been experienced. Elementary economic theory also fails to support the premise, since contractors must compete for workers as well as projects. An attempt by a contractor to pay unacceptably low wages would lead his workers to desert him. Nevertheless, fear of further deflation promoted passage of the bill in 1931.

The Davis-Bacon Act has successfully eliminated wage rates as an important element in competitive bidding for contracts involving Federal participation. The price of this success has been higher costs for covered construction. Large amounts of information and analysis are needed to produce arrays of wage rates taking so many factors into account. The staff that gathers and analyzes this information is fairly small, so it has taken advantage of ambiguities in the act's language to develop some simplifying procedures and rules of thumb. These shortcuts rely heavily on the wage rates and conventions regarding work rules that are found in collective-bargaining agreements.

Information on wages paid to union members is readily available, and in most areas, variation in union wages across workers in each class of labor is small. For these reasons, union rates are frequently adopted as the minimums that must be paid on covered projects. Since union wages are typically on the high side of the wage distribution, Davis-Bacon has pushed construction wages above their competitive levels. This effect is amplified by the insulation this practice provides union construction workers from nonunion competition.

The Davis-Bacon Act has always been controversial. Recent concern over low productivity, high inflation, and large Federal deficits has added fuel to the debate. It has often been argued that although prices determined in free markets efficiently distribute information and allocate resources, the misfortune and hardship suffered by some under such a system justify Government intervention in certain cases. Examination of the administration of the act yields useful insights into the difficulties faced by any agency assigned the task of improving on the outcome produced by market prices.

Administrative practices result in a bias toward union wages

The Department of Labor issues wage rate schedules, or "prevailing-wage determinations," that become part of construction contracts. These deter-

minations state the legal minimum wage for each of 10 to 300 building trades and skill levels. Some determinations are made for specific projects. Others, issued for areas where the need for determinations is frequent, apply to all similar projects in a geographic area.

Davis-Bacon contains deceptively simple language. Any construction contract covered by the law

...shall contain a provision stating the minimum wages to be paid various classes of laborers and mechanics which shall be based upon the wages that will be determined by the Secretary of Labor to be prevailing for the corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the city, town, village, or other civil subdivision of the State, in which the work is to be performed,...²

No elucidation of the meaning intended for the terms "prevailing," "laborers and mechanics," or "a character similar to" is provided. And the act does not prescribe a method of determining the prevailing wage, the appropriate civil subdivision, or the classes into which workers should be grouped. Important controversies have arisen over these issues.

The definition of "prevailing" is perhaps the most controversial element of administration of the act. In general usage the term means "most frequent," "common," "widespread," or "predominant." An average rate does not conform to this definition. It is calculated arbitrarily and usually not paid to anyone.

The labor market relevant to a covered project depends on its type and locality. The Department of Labor classifies construction projects as building, heavy, highway, or residential. High wage rates are most frequently paid on building projects, are less common on residential and heavy construction, and are least common on highway projects. The General Accounting Office, in several reports as recent as 1979, has questioned the project classification practices of the Department as being arbitrary and inconsistent.³

2. Davis-Bacon Act, U.S. Code, title 40, sec. 276a.

3. See, for example, U.S. General Accounting Office, *The Davis-Bacon Act Should Be Repealed*, Report to the Congress by the

The county is typically used as the geographic area, although some counties contain both low-wage rural and high-wage urban sections. And if the Labor Department staff does not have sufficient data to make a determination for a given county, it considers wage data from contiguous and even noncontiguous counties. Such "leapfrogging," which usually arises when covered projects are in rural areas, often results in higher urban wage rates being imposed on rural projects.⁴

The procedure for determining the prevailing-wage schedule is outlined by administrative guidelines, although they are difficult to apply consistently. Union rates generally are automatically considered prevailing in areas of union strength, while surveys are conducted for localities in which union representation is low. In these surveys, wage rates paid on similar projects under construction during the prior year are examined. Permissible evidence includes statements by contractors of wages paid, collective-bargaining agreements, state and local "little Davis-Bacon" determinations, information from contracting Federal and state agencies concerning previous federally funded projects, and field surveys. Data are voluntarily submitted by contractors and their associations, labor unions, public officials, and other interested parties.

Survey methods tend to bias determinations toward union wage rates. Information on union wages and rates paid on previous projects is readily available, but the number of contractors complying with requests for wage data is usually small. Therefore, union wage data make up a disproportionate share of the data sampled.⁵

The administrators have adopted a sequence of three alternative definitions for the term "prevailing." If the majority of workers receive a particular rate, that wage is determined to be prevailing—the "50-percent rule." That failing,

the rate most frequently received, provided at least 30 percent of surveyed workers receive the rate, will be assigned—the "30-percent rule." If no single rate is paid to at least 30 percent, the average rate is determined to be prevailing. The 30-percent rule greatly reduces the work load because it eliminates the need to conduct surveys in areas where union representation exceeds that proportion. In many cases, it leads to determinations reflecting union rates even though a majority of workers surveyed receive considerably less.

For example, a survey of Carson City painters by the Labor Department found two painters receiving \$6.25 an hour, two at \$8.74, one at \$9.00, and three at \$12.40.⁶ The average of these eight rates is \$9.52. But since more than 30 percent received the mode of \$12.40, this rate was the minimum wage issued by the Department. This example illustrates how a modal concept of the term "prevailing" results in overly frequent adoption of union rates. More union workers receive identical pay rates, whereas rates of nonunion employees vary more with their skill, experience, and other factors.

The 30-percent rule would not impart as large a bias toward union rates if federally funded projects were excluded from the survey. Where union pay scales have been assigned as prevailing, these rates must be paid on projects covered by the act even if some of the workers are nonunion and could be hired for less. Since wages on these projects are used to establish subsequent determinations, union rates are given disproportionate consideration. Once this practice is begun, all covered projects in the area will probably be assigned union rates automatically, unless union membership falls to a low level and protests are received.

Wage rate determinations can be appealed before a three-person Wage Appeals Board created by the Department of Labor. The number of appeals before the board has been quite modest, though rising in recent years. A contractor has little incentive to

Comptroller General of the United States, no. HRD-79-18 (Washington, D.C.: General Accounting Office, 1979), app. VIII.

4. See John P. Gould and George Bittlingmayer, *The Economics of the Davis-Bacon Act: An Analysis of Prevailing-Wage Laws* (Washington, D.C.: American Enterprise Institute for Public Policy Research, 1980), chap. 3; General Accounting Office, *Davis-Bacon Act*, pp. 50-51, app. IX; and D. N. Gujarati, "The Economics of the Davis-Bacon Act," *Journal of Business* 40 (July 1967):303-16.

5. The General Accounting Office independently surveyed wages for 277 worker categories in 30 locations and found union rates prevailed in 42 percent of these categories. The Labor Department, however, issued union-negotiated rates for 66 percent of the categories. See General Accounting Office, *Davis-Bacon Act*, chap. 5.

6. *Ibid.*, pp. 52-53.

appeal in cases where he feels the minimum has been set too high. He is not assured of winning the contract award if he wins an appeal, since competing bidders may pay the same wage rate. Moreover, he incurs substantial legal expenses and trouble.

Contractors could avoid paying the high wages Davis-Bacon requires by reclassifying skilled workers as laborers, apprentices, helpers, or trainees. Collective-bargaining agreements effectively prevent union contractors from practicing such evasion. To ensure that nonunion contractors do not evade the wage requirements of Davis-Bacon, the administrators have imposed unionlike restrictions on eligibility for the unskilled-worker classifications. Traditional union craft jurisdictions, based on tools used, must be respected, even though they limit the flexibility of work force utilization. Contractors are not permitted to pay less than a full journeyman's wage to an apprentice unless written evidence is provided that he is enrolled in a recognized apprenticeship program approved by the Department of Labor or a state agency. Approval requirements discourage nonunion contractors from developing apprentice programs. Use of trainees and helpers is severely limited by the Labor Department. While the restrictions are necessary to enforce the law, they raise labor costs, hamper the training and development of a skilled labor force, and impede the advancement of young workers.

Detailed weekly payroll reports from contractors to the contracting agency are also intended as an enforcement tool. In practice, they create burdensome paperwork costs without uncovering many violations. According to a survey of contractors, these costs are one-half of 1 percent of total contract costs.⁷

The act raises construction costs and disrupts labor markets

Any system of wage or price floors affects the allocation of resources. The Davis-Bacon Act creates distortions, even though it calls for wage minimums to be set at prevailing rates. Workers

7. Armand J. Thieblot, Jr., *The Davis-Bacon Act*, Labor Relations and Public Policy Series, no. 10 (Philadelphia: University of Pennsylvania, Wharton School, Industrial Research Unit, 1975), p. 80.

with relatively low skill levels become unprofitable to hire since they cannot be paid less than workers whose productivity is commensurate with the legal wage. Administrative shortcuts and rules of thumb further aggravate the problem because the minimum wages are sometimes established at levels above the rates normally earned by a large percentage of workers. Reforms of administrative practices recently proposed by the Labor Department—including abolition of the 30-percent rule, establishment of helper classes, and an end to importation of urban wages into rural areas—would reduce, but not eliminate, the distortions caused by the wage floors.⁸

The Davis-Bacon Act raises wage rates on Government-funded projects in those instances where determinations made are above market rates. In cases where the established minimums are below market rates—a common occurrence, due to out-of-date determinations—there is no evidence that the wages paid on the projects fall to the legal minimums. The General Accounting Office found workers were paid market wage rates when determinations were unrealistically low. The minimums stipulated had no effect. In cases of unrealistically high determinations, local contractors were discouraged from bidding, and contracts were more likely to be awarded to nonlocal high-wage labor. The General Accounting Office concluded that the act's intent of maintaining the locally prevailing wage structure and ensuring employment opportunities for local labor was fulfilled only when determinations were below market rates and, therefore, had no effect.⁹

Several studies suggest that the increases in labor costs due to inaccurate determinations are substantial. A survey of contractors in 1974 found that for half of the respondents, Davis-Bacon Act minimums exceeded rates ordinarily paid by an average of 36 percent.¹⁰ Since labor costs were estimated to be

8. The proposed changes in administrative rules were published in *Federal Register* 46, no. 157, August 14, 1981, 41444-53. The proposals are currently under consideration, with the decision about whether to implement them anticipated sometime this year. Implementation would increase the resources needed to administer the law.

9. See General Accounting Office, *Davis-Bacon Act*, chap. 5.

10. Thieblot, *Davis-Bacon Act*, chap. 9.

31.1 percent of total project costs, construction costs were estimated to be 5.6 percent higher than they would have been in the absence of the law. A more recent survey of wage rates led to estimates that inaccurate Davis-Bacon Act determinations added 3.4 percent to total project costs.¹¹ Estimates of labor cost savings from proposed reforms indicate enforcement of prevailing-wage ranges would have saved \$568 million in fiscal 1982. Establishing the average survey rate as the prevailing rate, by elimination of the 30-percent and 50-percent rules, would have saved \$210 million.¹²

Each of these estimates assumes that higher wage rates translate into proportionately higher total labor costs, which are passed on to the contracting agency in the bidding process. In fact, higher wage rates can be at least partially offset by higher productivity. Therefore, estimates of excess labor costs that do not account for productivity improvements overstate the extra cost of construction.

A contractor who offers premium rates on a job attracts more applicants and can assemble a better work force.¹³ Furthermore, contractors with the most productive workers are better able to make winning bids. These factors draw the most productive members of the construction labor force to Government-sponsored work and away from private projects.

An increase in labor productivity can likewise occur by substituting inputs. Higher wage rates induce adoption of more capital-intensive methods of production. When possible under the law, contractors also attempt to shift work to offsite locations, install larger pieces of siding, and use more prefabricated elements. Managerial or entrepreneurial inputs can be increased for better management of the expensive labor force. It must be noted, however, that each of the substitutions induced by premium wage rates raises the social cost in terms of other goods and services forgone.

The act also has some detrimental effects on productivity. Enforcement of union work rules, jurisdictional lines, and restrictions on the use of apprentices, helpers, and trainees reduce overall productivity and hamper the training and future availability of skilled workers. Nonunion contractors

complain that a worker's morale is reduced when he is moved from covered projects with premium wages to private projects with competitive wages. The problem is serious enough to discourage many contractors from bidding on covered work or to compel them to maintain the premium wages on uncovered work.

One study was able to incorporate some of these offsetting factors by examining savings to contracting agencies arising from the 30-day suspension of the act in 1971. Suspension permitted contractors to resubmit bids without minimum wage requirements. The low bids were generally lower when resubmitted, especially in predominantly nonunion areas in which the 30-percent rule would have mandated payment of union wages. Based on this evidence, labor costs were inflated by \$240 million to \$1 billion a year.¹⁴ And that estimate does not reflect cost savings that could be realized if contractors had a longer period to adjust to new market conditions stemming from repeal.

The Davis-Bacon Act alters the structure of the local labor markets. Requiring contractors who employ nonunion labor to pay union wage rates reduces or eliminates a competitive advantage nonunion contractors might otherwise have over unionized bidders. By insulating union shops from wage competition, the demand for union labor is increased. Furthermore, because union contractors can largely pass the cost of negotiated wage increases on to contracting agencies, resistance to aggressive wage demands is reduced. The union loses fewer jobs when it raises its wage schedule: the demand for union labor is made more inelastic.

Consequently, an indirect cost of the act is a strengthening of union monopoly power, which encourages more aggressive wage bargaining. A study of union wage rates from 1967 to 1969 found significantly higher rates in metropolitan areas in

11. General Accounting Office, *Davis-Bacon Act*, chap. 5.

12. *Federal Register*, August 14, 1981, pp. 41444-53.

13. "Quality adjustments"—acquisition of a more productive work force—may ensure that workers are paid no more than is commensurate with their productivity, even though a minimum wage is set. See Jeffrey M. Perloff, "Labor Market Adjustments in the Unionized Contract Construction Industry," *Journal of Labor Research* 2 (Fall 1981):337-53. However, the costs of assembling such a work force may be significant.

14. Thieblot, *Davis-Bacon Act*, pp. 89-94, and Gould and Bittlingmayer, *Economics of the Davis-Bacon Act*, pp. 56-60.

which a high proportion of construction was covered by the act, given the growth in total construction, the degree of unionization, and the average wage received by manufacturing workers in the area.¹⁵ According to a representative statistical result, an increase in the proportion of covered projects from 20 percent to 30 percent raises union wages by 27 percent.

The excess labor cost estimates cited above may be too low because they do not account for the impact of Davis-Bacon on the labor market. Repeal of the act not only would eliminate the wage premium on covered projects but also would most likely reduce the general level of construction wages, particularly for organized workers, resulting in additional savings.

Administered wages may contribute to inflation

The impact of prevailing-wage laws on inflation and unemployment is hard to assess. Some economists contend that wage rigidities, such as those established by various minimum wage laws, contribute to inflation. Monetary and fiscal policies can increase aggregate output in the short run if some wages or prices are fixed. Legislation that protects some wages from market forces may encourage stimulative policy. At the very least, the Davis-Bacon Act raises Government expenditures and adds to the Federal deficit, which can contribute to inflation. Public works projects, sometimes undertaken to stimulate employment, are rendered less effective in reaching the hard-core unemployed, since the law attracts the most skilled and productive workers to Government projects.

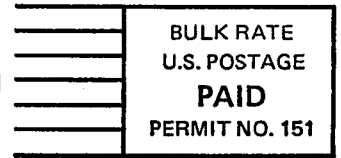
15. Ronald G. Ehrenberg, "The Economic Impact of Davis-Bacon Type Legislation: An Econometric Study" (unpublished paper, March 1971).



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