

# The NBER Digest

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## Efficiency of Foreign Exchange Markets and Measures of Turbulence

Spokesmen for a return to fixed exchange rates buttress their arguments by pointing to the "excessive turbulence" in the foreign exchange markets since the major trading countries of the world embarked on a generalized currency float seven years ago. They hold that this turbulence has had significant social costs. At a minimum, turbulence causes capital losses and the wasteful expenditure of resources to negate currency risk. At a maximum, it may have resulted in inappropriate patterns of production, consumption, and trade.

Not everyone agrees that fluctuating exchange rates have been as costly as the advocates of a return to fixed parities believe. Yet, there can be no doubt that rates have moved around a lot more than was expected. Mean absolute percentage changes in the dollar/U.K. pound, dollar/French franc, and dollar/Deutschemark rates from June 1973 to the end of the decade exceeded 2 percent a month—about twice as much as the average monthly changes in wholesale and consumer prices in the United States, the United Kingdom, France, and Germany during the same period.

Exchange rate changes were not only large, they were also unpredictable. The forward premium or discount on foreign exchange, widely regarded as a predictor of future rates, accounted for only a small fraction of actual changes since 1973. Moreover, short-run changes in exchange rates bore little relationship to short-run differentials in national inflation rates, as measured by the various price indexes. Indeed, changes in the dollar/Deutschemark rate over fairly long periods of time diverge quite sharply and cumulatively from purchasing power parity.

According to a recent study by NBER Research Associate **Jacob Frenkel** and **Michael Mussa** of the University of Chicago, *Working Paper No. 476, Efficiency of Foreign Exchange Markets and Measures of Turbulence*, deviations of exchange rates from purchasing power parity are not in the least mysterious. In the

authors' view, foreign exchange markets are efficient asset markets—that is, organized markets in which prices are adjusted on a moment-to-moment basis to whatever the market regards as the currently appropriate price. In brief, exchange rates resemble stock prices, long-term bond prices, and commodity prices. In this connection, it should be noted that the average monthly movement of exchange rates, although much larger than changes in relative wholesale and consumer prices, was less pronounced than average monthly movements in stock prices in the United States, the United Kingdom, France, and Germany during the 1973–79 period.

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Like other asset prices, exchange rates do not adjust smoothly or slowly, but rather display random fluctuations in response to the new information that is continuously received by the market. In the last seven years, the world has experienced the widest variations in output, employment, inflation, and government policy ever seen in the post-World War II era. So, extreme volatility in exchange markets becomes perfectly understandable. Exchange rates have responded not only to events and policies but also to their effect on expectations concerning future events and policies.

Frenkel and Mussa emphasize a key difference between changes in exchange rates and changes in national price levels. Exchange rates, again like many other asset prices, are serially uncorrelated—that is, movements in a given time period do not depend on

movements in a previous time period. Changes in national price levels, however, exhibit strong serial correlation, in part because of the persistence of contracts and the costs of frequent price changes. Since exchange rates move quickly, while national price levels adjust sluggishly, it is to be expected that exchange rate movements will diverge from purchasing power parity for considerable periods of time.

Frenkel and Mussa address the question of whether exchange rate fluctuations have been "excessive." They point out that dire predictions to the contrary, floating rates have not caused a collapse of world trade or international financial markets. Under fixed rates, they note, relative price adjustments are achieved through slow changes in national price levels and through occasional parity realignments. Under floating rates, adjustments in the relative prices of national outputs occur rapidly and in anticipation of changes in economic conditions. There is no general presumption, they argue, that slow adjustments are preferable to rapid ones. Indeed, since prices play an important role in communicating the need for resource redeployment, rapid and anticipatory changes in the relative prices of national outputs may contribute to the efficiency of the world economic system.

True, part of the extreme variability of exchange rates may represent an "overshooting" response to purely monetary disturbances, but Frenkel and Mussa assert that there is no reliable evidence that rate movements are dominated by overshooting. What's more, they claim, overshooting may not be such a bad thing. If domestic price levels do not adjust with sufficient rapidity to changes in current and expected economic conditions, then excessive adjustment in other prices—namely, exchange rates—may cause needed adjustments to occur more rapidly.

Frenkel and Mussa are wary of governmental efforts to damp the variability of exchange rates. Technically, governments can reduce variability by various policies culminating in pegged rates, but such policies will merely transfer disturbances from the foreign exchanges to other markets, not necessarily reducing their impact or lowering their social cost. It is comparatively easy to ensure against risk in the foreign exchange market, but if disturbances are transferred to other markets, they cannot be handled so efficiently.

Finally, the authors caution that it makes no sense to talk about exchange rate policy, since rates are not policy tools that can be manipulated independently of other macroeconomic variables. Nonetheless, governments can eliminate costly and unnecessary foreign exchange turbulence by reducing high and variable rates of monetary expansion. Such expansion, they argue, results in part from misguided attempts to stabilize nominal interest rates. Frenkel and Mussa contend that the unpredictability of monetary policy, especially U.S. policy, has contributed significantly to foreign exchange turbulence in the post-1973 period. By reducing monetary growth and the variance of that

growth, U.S. policymakers can both lower inflation and reduce economic uncertainties. That, in turn, would eliminate much foreign exchange turbulence, while enhancing the role of the dollar as "world money."

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## The Impact of State and Local Taxes on Corporate Capital

In a recent study for the National Bureau of Economic Research, **Martin Feldstein** and **James Poterba** conclude that state and local taxes reduce the return to capital of nonfinancial corporations by 1.8 percentage points, approximately 16 percent of pretax returns. Failure to take state and local taxes fully into account causes understatement of both total rates of return and total tax burdens.

In *Working Paper No. 508, State and Local Taxes and the Rate of Return on Nonfinancial Corporate Capital*, Feldstein and Poterba estimate the taxes paid by nonfinancial corporations (NFCs), their shareholders, and their creditors from 1948 to 1979. First, they calculate the total taxes that the corporations themselves paid to states and localities. For 1979, they find that these taxes on corporate profits are \$11.6 billion and that property taxes, assuming that NFCs are subject to the same rates as others, are \$19.3 billion.

Adding the property taxes into corporate income figures, Feldstein and Poterba estimate a new figure for pretax return on corporate capital. Between 1948 and 1979, the total pretax rate of return was 11.4 percent according to their calculations; conventional calculations yield a figure of 10.2 percent.

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In addition, state and local governments collect taxes from shareholders and creditors. Feldstein and Poterba ignore the state and local taxes on individuals' capital gains and interest income. They include only the state taxes on dividend receipts by households and exclude all taxes on creditors in their calculations. This causes an understatement of the resulting estimated tax calculations.

The authors compute the total effective tax rate, including federal, state, and local taxes, on the capital of

NFCs. From less than 60 percent in the mid-1960s, the combined total effective tax rate on the capital income of the NFC sector has risen to 74 percent in 1979. Between 1953 and 1979, the effective rate averaged 70.6 percent.

Finally, Feldstein and Poterba are concerned with the real aftertax return on nonfinancial corporate capital, after taking all taxes into account. They find that the return, which was 3.4 percent from 1953 to 1959 and rose to above 6.0 percent in the mid-1960s, was only 2.3 percent in 1979.

## Economic Growth and Service Employment

Economists have recognized for decades that rising real income in a society is accompanied by a shift of employment out of agriculture and into industry and then services. In 1940, Colin Clark observed: "The most important concomitant of economic progress is the movement of labor from agriculture to manufacture, and from manufacture to commerce and services." A recent study by NBER Research Associate **Victor R. Fuchs** provides new confirmation of Clark's observation and shows that different countries follow remarkably similar employment patterns as incomes rise. Fuchs also finds that the increase in female labor participation during the postwar years probably hastened the shift to service employment in the United States. His findings are reported in **Economic Growth and the Rise of Service Employment**, *Working Paper No. 486*.

The prediction that relatively more people will be employed in the service sector as per capita income rises is not grounded on economic theory. Instead, Clark's comment and Fuchs's findings have to do with empirical regularities. Even so, they throw light on the growth process as it has evolved. The patterns have been so regular that they allow private and government decision makers to anticipate coming shifts in employment.

Fuchs first verified Clark's observation in research on U.S. employment that he did for NBER in 1968 and 1969. His new work updates the earlier studies and compares the U.S. pattern with employment in twenty-three countries that belong to the Organization for Economic Cooperation and Development (OECD). In this study, Fuchs develops a series of equations that relate the shares of total employment in agriculture, industry, and service to the level of per capita gross domestic product (GDP).

The historical pattern in the United States is clear. In 1870, when per capita GDP was \$810 (in 1970 dollars), 47 percent of the labor force was in agriculture,

27 percent in industry, and 26 percent in service. By 1950, when per capita GDP was \$3,439, agriculture had fallen to 12 percent of total employment, industry was 42 percent, and service 46 percent. In 1978, per capita GDP was \$5,752 and only 3 percent of the labor force worked in agriculture. Industry's share had fallen from its 1950 peak to about 36 percent, and 60 percent of all workers were in service occupations. In statistical terms, the correlation coefficients between per capita GDP and the shares of employment in the three sectors were all 0.90 or higher.

This close correlation could simply reflect responses to changing tastes or technological advances that happened to coincide with the trend in real GDP. However, Fuchs also estimates the equations for the twenty-three other countries at three points in time—1960, 1970, and 1976—and finds that the pattern was very close to the U.S. experience. Since the pattern of employment in different countries at one point in time mirrored U.S. employment over the years, it is unlikely that the shifts were a quirk of history. Fuchs finds that in most cases, industry's share of total employment peaked when per capita GDP was in the \$3,000 to \$3,500 range (in 1970 dollars). For the four sets of estimates—the U.S. historical record and the OECD countries in the three different years—the median correlation coefficient between sector employment and per capita GDP is 0.88.

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While the patterns of shifting employment were similar, there were noticeable differences across countries in the levels of employment in various sectors. For instance, at any given level of per capita GDP, the United States had an unusually large fraction of the labor force in the service sector and a small fraction in industry. The portion in industry peaked at about the same per capita income, but it peaked at a lower percentage. Similarly, Greece and Turkey have consistently had larger shares of their labor forces in agriculture and smaller shares in industry than Fuchs's equations predict for their levels of income. Also, West Germany's industrial employment was unusually high in 1970 and 1976. Fuchs surmises that the rapid growth of West Germany's industrial exports may have caused this rise.

Many economists contend that the increase in service employment stems from different income elasticities of demand (for example, as income rises the demand for financial services increases more rapidly than the demand for food). Fuchs believes that theory is correct in the case of the relative growth of service

and agricultural employment, but that the major phenomenon in countries with high incomes is the growth of service employment at the expense of industrial employment, which Fuchs believes is due more to differential trends in labor productivity. He notes that the rate of growth of service employment in the United States exceeded the growth of industrial employment by 1.55 percentage points per year from 1948 to 1978. Yet service output grew only 0.40 percent per year faster than industrial output. Thus, 1.15 of the 1.55 percentage point difference in the growth of employment is attributable to different trends in output per worker.

Fuchs also examines the extent to which increasing female labor participation may have hastened the rise of service employment in the United States. The female labor participation rate has increased along with per capita GDP and service employment in the United States, but there is no similar correlation between the proportion of women in the labor force and the proportion of service jobs or income in other countries.

It is possible that there is a causal connection between real GDP and female labor participation. NBER economists Gary Becker and Jacob Mincer have argued that economic growth raises the value of time in the labor force relative to the value of time at home, inducing higher female labor participation. When wives go to work their households' demand for services may rise relative to the demand for goods for two reasons. There may be an income elasticity effect, and the family may reallocate expenses because the wife has less time to work at home.

Fuchs tests the effect of working wives on household demand with data from the BLS Consumer Expenditure Survey for 1972-73. He restricted the sample to white, home-owning families with one or two children under 18 years old in order to eliminate other possible effects on demand. Fuchs's experiments suggest that the share of a household's expenditures going to services rises about 10 percent (from, say, 30 percent to 33 percent) if the wife works. This change is net of any income elasticity effects due to the added earnings the wife brings home.

Since the proportion of working wives has risen about one percentage point per year in the postwar period, a 10 percent increase in service expenditures would have boosted the demand for services by about 0.1 percent a year (1 percent of 10 percent) relative to the demand for other output. This is about one fourth of the 0.4 percent per year shift of output to services since 1950. Fuchs's test is not definitive, but it does suggest that the greater incidence of working wives has contributed to the rise of service employment through a reallocation of expenditures toward services. Fuchs points out, though, that the increase in the number of working wives was not a cause of the slowdown in productivity growth during the 1970s. Female labor participation rose at a fairly steady pace in the postwar period and wouldn't have affected productivity growth noticeably more in the 1970s than it did in the 1950s and 1960s. AE

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