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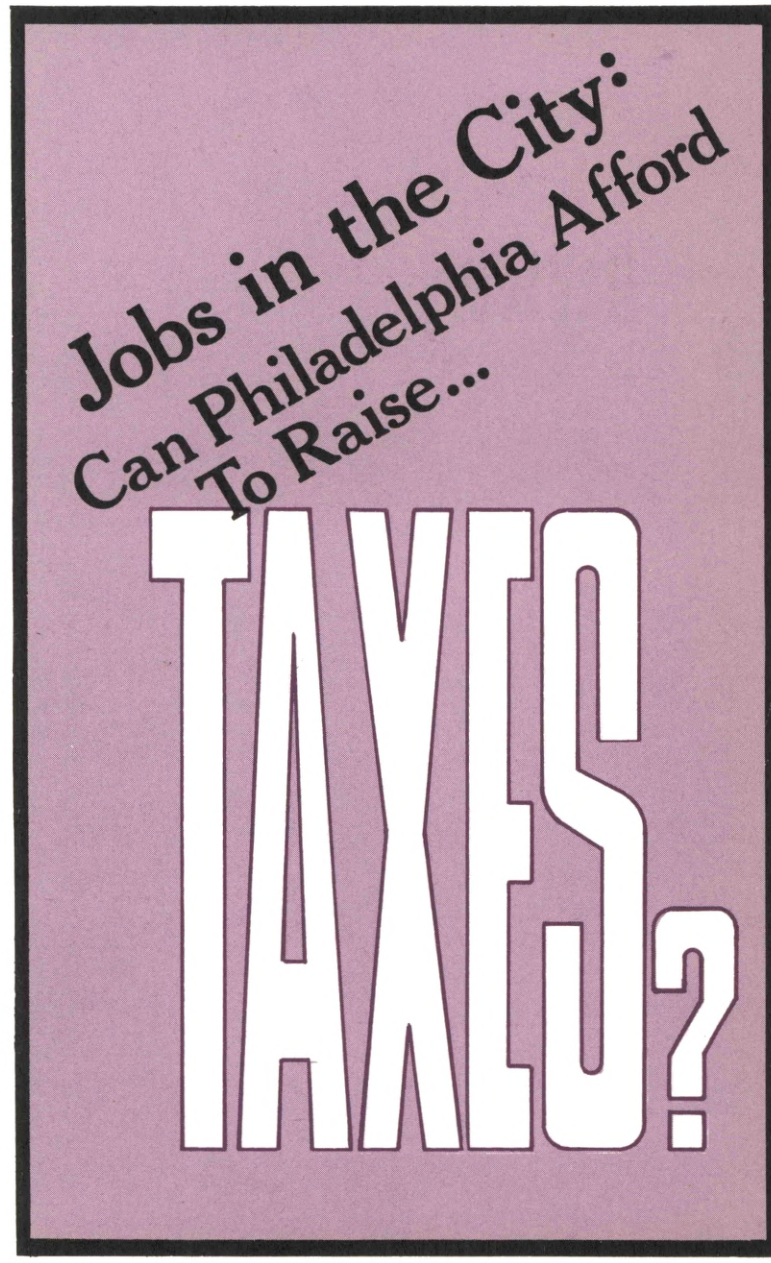

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John Gruenstein

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Federal Reserve Bank of Philadelphia
100 North Sixth Street
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Philadelphia, Pennsylvania 19106

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Nicholas Carlozzi

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The Federal Reserve Bank of Philadelphia is part of the Federal Reserve System—a System which includes twelve regional banks located around the nation as well as the Board of Governors in Washington. The Federal Reserve System was established by Congress in 1913 primarily to manage the nation's monetary affairs. Supporting functions include clearing checks, providing coin and currency to the banking system, acting as banker for the Federal government, supervising commercial banks, and enforcing consumer credit protection laws. In keeping with the Federal Reserve Act, the System is an agency of the Congress, independent administratively of the Executive Branch, and insulated from partisan political pressures. The Federal Reserve is self supporting and regularly makes payments to the United States Treasury from its operating surpluses.

Jobs in the City:
Can Philadelphia Afford To Raise Taxes?

*By John Gruenstein**

No argument has been so consistently used against new state taxes or increases in rates, especially those affecting businesses, than the 'drive industry out' thesis . . . In terror of 'driving business out', legislators become unwilling to adjust taxes to levels necessary to meet the desires of the community for services, and to bring the tax structures in line with popularly accepted ideas of equity in taxation.— John Due, *Land Economics*, 1961.

The city tax burden is so heavy that to increase rates significantly very probably would reduce revenues by driving taxpaying businesses and residents out of town. — Editorial, *The Philadelphia Inquirer*, November 7, 1979.

The major task facing city officials in recent months has been to deal with the revenue shortfall projected for next year's city and school district budgets. Estimates of this shortfall, which range from $75 million to almost $200 million, already have caused Standard and Poor's to lower the city's bond rating. To cope with this gap and avoid further damage to the city's fiscal position, effective short-term measures clearly had to be taken.

But whatever near-term steps are necessary, some very basic structural questions—with important longer run implications—also need to be addressed. One of the most important involves the link between changes in local taxes and employment changes. Over the last decade, Philadelphia has lost about 130,000

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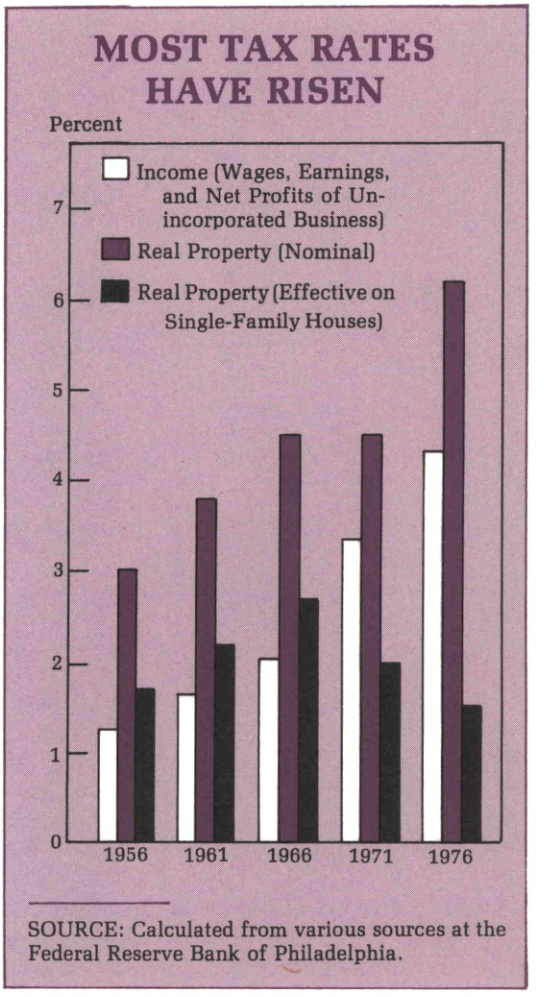
jobs. Over roughly the same period, city wage and property tax rates have risen sharply—more than doubling in the case of the wage tax. To what extent are these events related? Will future tax increases mean still fewer jobs?

While predicting how large an impact future tax rate changes will have on employment is a chancy business, clearly they will have some impact, and that impact will be related to the size of the change. Thus the city has little choice but to estimate as closely as possible how large a tax increase it can impose now—large enough to stave off cuts in necessary services, but small enough to have only a negligible effect on employers' profit margins—and then to look ahead to a longer term tax policy. Holding taxes down in Philadelphia shouldn't be the only target of the city's fiscal policy. In today's environment of widespread suspicion of government, a whole range of issues connected with the stability and soundness of the city's financial management needs to be addressed. But taxes can't be ignored either.

TAXES CLIMB AND JOBS SLIDE

Since World War II, most taxes in Philadelphia have climbed steadily (see MOST TAX RATES HAVE RISEN). In 1947, the tax rate on wages, earnings, and net profits stood at 1 percent. Today it's up to 4 5/16 percent. The nominal property tax rate—the rate on assessed values—has about doubled, growing from just under 3 percent to over 6 percent. While the property tax rise was completely offset by a falling ratio of assessed value to market value for residential and industrial property, *commercial* properties probably saw their effective tax rate—the tax as a percentage of market value—rise.[1] And other taxes—the school tax on unearned income, the general business tax, the business use and occupancy tax, the mercantile license tax—were instituted or increased during the 1960s and 1970s.

During roughly the same period the number of jobs in the city slid by around 15 percent. Virtually all of this decline has taken place since the end of the 1960s, when the wage tax stood at less than half its current level.



SOURCE: Calculated from various sources at the Federal Reserve Bank of Philadelphia.

[1]According to figures supplied by the City Finance Director's Office and the City Controller's Office, in 1965 and 1975 the effective tax rates for different classes of property were:

Class of Property	1965	1975
Private residential	2.28%	1.76%
Commercial	2.30	2.47
Industrial	2.59	1.96

And the city's performance looks especially dismal vis-à-vis the metropolitan area and the nation, since employment in both these areas was growing over much of this time span.

The postwar era has seen many changes which complicate the tax-employment picture in Philadelphia. Increasing automobile ownership, proliferating highways and roads, rising incomes, and government subsidization of new suburban housing combined with other factors to spur firms and people toward the greener pastures outside the city's boundaries and taxing powers. At the same time, many relatively poor and unskilled workers were heading for the nation's traditional job centers—Philadelphia among other Northeastern cities—only to find the prospects for jobs distinctly less rosy than they had expected. Fewer jobs plus a changing population lowered the revenue base of the city while raising the demand for local services, kindling and fanning the flames of tax increases. The overall result has been a vicious cycle—lower employment causing higher taxes in turn causing still lower employment.

While it may be interesting to ask which came first—higher taxes or lower employment—policymakers have direct access only to the tax level. And so they have been looking ever more closely at how a shift in that level large enough to close the revenue gap would be viewed by the employers whose businesses provide jobs for Philadelphia workers.

SURVEYS: WHAT DO BUSINESSMEN SAY ABOUT TAXES?

One way to find out how important taxes are to businessmen is to ask them. When respondents are asked to rank the tax level as a location factor, they do not put it near the top of the list. Numerous surveys in Philadelphia and elsewhere have shown taxes ranking after markets, raw materials, labor, and transportation as location determinants for firms. But survey takers still are told, and sometimes vociferously, that taxes are too high.

In 1975, for example, the Philadelphia City Planning Commission (PCPC) and the Philadelphia Industrial Development Corporation (PIDC) carried out a survey of manufacturing and warehousing firms in the city to identify factors that influence firms' location decisions and thereby assist the PIDC in planning economic development programs. Relatively few firms listed taxes in the city as a critical problem. Firms that were considering a move within three years tended to attach a greater weight to taxes than firms that weren't, but even they usually ranked taxes below transportation, labor (availability, cost, and quality), and site characteristics. Taxes alone rarely caused firms to relocate. Businessmen who already had made the decision to move *somewhere,* however, frequently described taxes as responsible for the choice of a new site outside the city limits.

Concern about higher city taxes was echoed in another survey of about 80 executives whose firms actually had made a move outward from Philadelphia between 1972 and 1977. When interviewed by Frank Coolsen of Temple University in 1977, more than half of these businessmen claimed that the city tax structure—and in particular the wage tax, which had risen from 3 5/16 percent to 4 5/16 percent the year before—was an important reason for leaving the city. True, the wage tax seemed less important than the superior physical facilities, neighborhoods, and security in the suburbs. But the PCPC/PIDC and Coolsen surveys did provide an indication that taxes have played some role in the city's loss of jobs.

In 1977, a report entitled *The Impact of Local Taxation on the Economy of Philadelphia* (often referred to as the Sternlieb study after its senior author, George Sternlieb) presented numerical estimates of the decrease in employment by city employers that would

result from increases of 5 percent and 10 percent in the total taxes paid by businesses (public service levels were assumed constant). Over a period of five years the decreases in employment worked out to be -4.7 percent and -7.3 percent respectively.[2]

But these figures probably were too high. While some features of Sternlieb's method may have tended to reduce the size of the overestimate (he failed to count firms that would have moved to Philadelphia or been founded here except for the tax increase, for example), the over 400 Philadelphia employers who participated in the survey probably were much more sensitive than usual to taxes because they just recently had seen a sharp rise; their tendency would be to overstate rather than to understate the impact of taxes on location plans.[3]

Thus neither the earlier surveys nor Sternlieb's estimates provide a fool-proof basis for determining what the ratio of job loss to tax increases would be. All surveys suffer from the defect that people don't always do what they say they're going to do, and this is as true of business location surveys as of other kinds. Thus, in addition to taking surveys, it pays to look at what firms actually do in the face of tax rate changes.[4]

STATISTICAL STUDIES: WHAT DO FIRMS DO?

Many statistical studies have looked at how tax levels are related to the amounts and growth rates of employment and have found little tax effect. In the past few years, however, two studies authored primarily by Ronald Grieson, one for New York and one for Philadelphia, have pointed to a much greater negative response by business to city taxes.

The Grieson Studies. As reported in the *Journal of Urban Economics,* Grieson and some other researchers tried to estimate the effect of a 1966 change in the business tax structure on the growth of various industries in New York. The tax change involved going from what was essentially a gross receipts tax to a structure resembling a net profits tax. Taxes went up on some firms and down on others, changing in a way which the authors felt was sufficiently independent of other location factors to allow them to isolate taxes as a causal influence. Grieson and his colleagues compared employment in various industries for a number of years after the tax change with what employment would have been given past trends. They found that manufacturing industries seemed to respond to a 10-percent rise in taxes with a loss of about 3 ½ percent in jobs over four to five years. For nonmanufacturing they found tax increases associated with job *gains,* but the effect was not statistically significant.

Using a different approach for Philadelphia, Grieson estimated that both manufacturing

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[2]A handy way to summarize these results is to use a standardized measure of responsiveness called an elasticity, which is computed by dividing the percentage change in one variable by the percentage change in a second variable. For the employment and tax changes presented above, the elasticities work out to be -.93 for a tax rate change of less than 5 percent and about -.73 for a tax rate change around 10 percent.

[3]There were at least two other methodological biases which would have led to overestimates of job loss. First, Sternlieb's figure for the average number of employees that each firm would cut came from a question asking about plans to cut *in general* over the next five years, with no reference to taxes. Second, in calculating the response to this or that tax, as opposed to an overall rise, he assumed that the wage tax and the property tax accounted for 100 percent, rather than the actual 80 percent, of the tax base.

[4]There is another difficulty with surveys. Merely adding up all the individual responses neglects the fact that each decision to produce less or hire fewer workers will have an impact on other firms' actions through market forces. As some firms lay off employees, wages might go down, reducing pressure for others to cut their workforce. Also the demand for goods produced by the firms could go down as city income and business activity drop. Thus the whole picture could wind up being more or less than the sum of its parts.

and nonmanufacturing sectors were quite responsive to the city wage tax. The fall in the Quaker City's share of U.S. employment for various industries was explained statistically with a time trend and a variable representing the city wage tax. For manufacturing the response was again about a 3 ½-percent loss in employment over four years for a 10-percent increase in the wage tax rate. For nonmanufacturing the estimated loss for the same tax increase ranged from a 3-percent loss in services to a whopping 21.4-percent loss in contract construction.

Because of difficulties with Grieson's original estimates for Philadelphia, they have been redone at this Federal Reserve Bank using data from other sources and different time periods (see Appendix). The estimates of the strength of the tax effect varied considerably depending on the time period and data used, and Grieson's figures lay near the top of the range. And while his approach predicted a job loss from all causes (trend and the 1976 wage tax increase) of nearly 80,000 jobs between 1976 and 1980, the actual loss over the period was only about 10,000.[5] Thus while Grieson's results represent a challenge to the older studies that showed little or no measurable effect of tax increases on local employment levels, his results for Philadelphia, at least, probably overestimated the tax effect by a significant margin.

Best Guess: Small but Significant Loss. The results of these surveys and statistical studies suggest that any numerical estimate of the jobs to be lost in Philadelphia because of a future tax increase is subject to a wide margin of error. Uncertainty about the size of the loss is increased further by the difficulty of dealing with three other factors: public services, expectations, and the mix of tax increases used to fill the gap.

The city could reduce the need for a tax increase by cutting back on public services, but service cuts also have an impact on business location decisions. Most studies support the premiss that, in general, firms are less affected by services than by taxes, but virtually no one has been able to calculate how much less. The *pattern* of cutbacks is important, too, with protection services—police and fire—usually ranking highest on businessmen's priority lists.

Businessmen's expectations about what the city may do about taxes also are hard to gauge. Given the upward trend in tax rates and the weakening in the city's fiscal condition, however, many businessmen probably have anticipated some tax rise for quite a while. This doesn't mean that an increase will have no effect, as some would claim, but that the job losses will be spread out over time, some occurring before the actual rise in taxes as well as some after. Pinpointing the dynamic pattern of job losses would be very difficult.[6]

Finally, the mix of tax increases used to fill the gap also will affect the estimates of job loss because different taxes have varying impacts on business costs and affect businesses differently. Most surveys and statistical studies have found, for example, that businesses are less sensitive to the property tax than to the income tax.[7] And the sensitivity of jobs to property tax rate increases in

[5]Grieson's model actually estimates the change in Philadelphia's share of U.S. employment, which is used to calculate numerical job loss estimates. Over the 1975-78 period, the actual annual loss of employment share by industry group ranged from about 32 percent to about 75 percent of the estimated loss.

[6]It is true that the more firmly a pattern of fiscal crises followed by tax increases has been set into businessmen's minds the less reaction there will be to any one particular increase—whether larger or smaller than expected. If a smaller than expected increase is seen as signalling a change in policy—as it might be at the start of a new administration—then the response to this change would be greater than if it is thought that a lower than average increase now will just be made up by a larger than average one later.

[7]The fact that the property tax burden falls more heavily on capital-intensive firms than on labor-intensive

Philadelphia almost certainly has been lowered by the recent enactment of a five-year property tax abatement program for new businesses and improvements to existing businesses.

But despite these sources of uncertainty, broad conclusions can be reached. The contention that the losses will be extremely large seems questionable. The two studies upon which this contention could rest—the Sternlieb report and Grieson's Philadelphia study—appear to suffer from methodological difficulties which lead to overestimates of the job loss. The previous surveys and statistical studies, including the study of New York by Grieson and others, point to more moderate losses in jobs.

Somewhere between $100 million and $150 million in additional tax revenues will be needed in fiscal 1981.[8] Current city and school district tax revenues total just about $1 billion, so the add-on represents a 10-percent to 15-percent rise. Judging from the entire set of previous studies it seems reasonable to assume that every 10-percent rise in taxes will bring an employment loss of somewhere between 1 percent and 2 ½ percent. A tentative best guess of the decrease in employment attributable to the tax increase package is in the 1-percent to 4-percent range over the next five to ten years, meaning a loss of 8,000 to 32,000 jobs.

Such a loss, one can argue, is relatively small when compared to the losses and gains that would be expected from other factors like the business cycle, the normal decline and growth of different industries, competition with other geographic areas, and changes in Federal government activity. Also, such a loss is far too small to cause the tax rate increase to be counterproductive, in the sense of actually decreasing revenues (see WHEN IS A TAX INCREASE COUNTERPRODUCTIVE?). But job losses should not be ignored. Tax hikes still mean some increased unemployment in the city.[9] This entails costs to those actually laid off, to those in the already sizable pool of unemployed and underemployed, and to the city itself, since service demands probably would rise. And many forecasters are predicting that the long-expected recession is about to hit, which surely makes any move that worsens the business climate even less desirable.

THE RIGHT POLICY

Real life is complicated. The right tax increase depends on a host of things in addition to the effect on employment—such issues as what effect different levels of taxes will have on city services and how taxes and services will affect households as well as businesses. All of these are highly uncertain.

Our best estimate says that taxes in the city are not so high that any further increase would break the camel's back and drive away legions of businesses—especially if businessmen can be assured of the overall soundness of the city's financial management and of the outlook for stability over the longer term. Taxes can be raised without having the heavens fall in. But taxes do have an effect on jobs. And the uncertainty surrounding the size of the effect argues for erring on the low side of an increase rather

ones also leads to a differential effect. In the short run, capital-intensive firms may be less mobile because of large moving costs, and so property tax increases would evoke less response from them. In the long run, however, the response could be greater because capital-intensive firms may find less advantage in an urban environment than labor-intensive firms, whose need for face-to-face contacts is usually greater.

[8]The currently proposed budget includes an increase in total tax revenues of about $62 million, and it is virtually certain that this amount will have to be increased to provide funds to the school district, to meet labor demands, and to make up for funding cutbacks by other levels of government.

[9]In the long run people will find jobs elsewhere—in the suburbs or other cities. It can take a long time to get to the long run, though. As John Maynard Keynes once wrote, "in the long run we are all dead."

WHEN IS A TAX INCREASE COUNTERPRODUCTIVE?

In principle it is possible that an increase in tax *rates* could lead to a decrease in tax *revenues*. Such an effect (sometimes dubbed the Laffer Curve effect after Arthur Laffer, an economist at the University of Southern California) depends on a very large loss of tax base for a rise in taxes. A simple measurement of elasticity (percentage change in one variable divided by percentage change in another variable) shows how this would work.

The elasticity of employment with respect to a wage tax change is negative—that is, employment falls when the wage tax increases. Suppose that the size of the elasticity is larger than one. Then for each one-percent increase in the wage tax, the city would lose *more* than one percent of its jobs. And although tax revenues will rise one percent from jobs that *remain* in the city, tax revenues lost because jobs have left the city will be *more* than one percent. Why? Because the elasticity tells us that more than one percent of the jobs have left. The net results: tax revenues *fall* rather than increase in the face of a higher tax rate.

In practice the range of estimated elasticities is much smaller than one, so the loss of base would be offset by the gain in revenues. The size of the effect may be judged by looking at how large a tax *rate* increase is needed to achieve a particular fixed amount of tax *revenues*. Suppose the city needed to raise wage tax revenues by about 35 percent—roughly $175 million. At the relatively low elasticities of employment to wage tax rate which probably obtain—about -.04 to -.10—the required increase in the wage tax rate would range from about 36 percent to 39 percent.* Thus, practical differences between tax rate rises and tax revenue increases are almost negligible, especially since the loss of base would be spread out over four to five years. †

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*Since the wage tax is about 40 percent of total tax revenues, the range of elasticities (-.40 to -.10) is about 40 percent of the range of elasticities for total taxes.

† Grieson's Philadelphia study claimed that the city was virtually at the revenue maximizing point in 1975. But as is pointed out in the text his elasticity estimates seem far too high. Even with these high elasticities his result only follows because he assumes that *all* tax bases—property values, receipts, etc.—would fall by the same percentage as employment from a wage tax increase. This assumption seems unduly pessimistic and is not warranted by any empirical evidence.

than the high, for fear that the worst case could come to pass.

The message is that whatever the tax increase this year, in the longer run the city cannot keep balancing its budget by increasing tax rates. Taxes may or may not be too high today, and the tax increase may or may not make them too high tomorrow. But if the total tax burden continues to go up, it surely will be too high someday.

Philadelphia probably can afford a moderate tax increase now. But because of the cumulative effect of tax rate increases on the employment base, the city will have to find other ways to balance its budgets over the long haul.

APPENDIX . . .

. . . REESTIMATING THE

Grieson's study of Philadelphia, forthcoming in the *Journal of Urban Economics*, suffered from several defects. Some of the time series were spliced from two different sources—*County Business Patterns* (U.S. Department of Commerce) and *Employment and Earnings* (U.S. Department of Labor). Further, because some observations for the last two years in the sample (1974 and 1975) were not available at the time the study was made, extrapolations of the data points were used rather than actual data. Finally, the length of the time period—eleven years—is fairly short.

Researchers at the Philadelphia Fed have reestimated Grieson's results by regressing Philadelphia's share of U.S. employment (total and five sectors) on time and a four-year moving average of

REESTIMATE OF GRIESON MODEL USING DATA FROM *COUNTY BUSINESS PATTERNS*, 1953-1976*

Employment by Sector	Number of Observations	R^2	Durbin Watson	Constant	Year†	Tax†	Tax-Induced Job Change (thousands of jobs)
1. Total‡	24	.98	.43	.492 (10.88)	-.241 (-10.40)	-1.33 (-6.01)	-83.3
2. Manufacturing	24	.99	.91	.772 (12.19)	-.384 (-11.81)	-1.23 (-3.96)	-23.3
3. Services	24	.77	.32	.004 (.03)	.009 (.14)	-2.19 (-3.56)	-29.2
4. Finance, Insurance, Real Estate	24	.91	.77	.771 (6.33)	-.383 (-6.11)	.166 (.28)	+0.7
5. Wholesale	24	.99	1.50	.934 (12.55)	-.465 (-12.16)	-1.28 (-3.51)	-5.7
6. Retail	24	.99	.95	.906 (23.91)	-.455 (-23.37)	.071 (.384)	+0.9
Total,§ sectors 2-6	—	—	—	—	—	—	-56.6

* Data for 1953-64 reported every third year. Missing observations filled in using linear interpolation.

† Coefficients multiplied by one thousand.

‡ Overall total employment, estimated as separate equation.

§ Sum of individual industry group estimates.

GRIESON RESULTS

the wage tax rate for two different sets of data over two time periods. The results for the earlier time period (1953-76) show a relatively strong tax effect, but those from the later period (1969-79) do not. Use of the model as a predictive device for forecasting the effect of tax changes on employment in the 1980s thus seems highly questionable. Results of the reestimates are given below.

Both the original estimates and the reestimates still are subject to certain statistical difficulties, not the least of which is that of distinguishing the effect of taxes on jobs from the effect of job loss on taxes. Further details are available from the author.

REESTIMATE OF GRIESON MODEL USING DATA FROM *EMPLOYMENT AND EARNINGS*, 1969-1979

Employment by Sector	Number of Observations	R^2	Durbin Watson	Constant	Year*	Tax*	Tax-Induced Job Change (thousands of jobs)
1. Total †	11	.99	1.15	.866 (4.67)	-.433 (-4.57)	-.0852 (-.20)	-7.4
2. Manufacturing	11	.99	.96	1.413 (4.62)	-.712 (-4.56)	.559 (.80)	+11.6
3. Services	11	.95	2.97	1.857 (3.67)	-.938 (-3.63)	2.71 (2.33)	+44.5
4. Finance, Insurance, Real Estate	11	.95	.75	.654 (.74)	-.321 (-.71)	-1.40 (-.69)	-6.7
5. Wholesale	11	.99	1.25	.942 (1.88)	-.468 (-1.82)	-1.64 (-1.42)	-8.2
6. Retail	11	.96	1.25	.312 (.59)	-.152 (-.56)	-1.33 (-1.09)	-19.3
Total, ‡ sectors 2-6	—	—	—	—	—	—	+21.9

* Coefficients multiplied by one thousand.

† Overall total employment, estimated as separate equation.

‡ Sum of individual industry group estimates.

PHILADELPHIA FED
Research PAPERS

The Philadelphia Fed's Department of Research occasionally publishes research papers written by staff economists. These papers deal with local, national, and international economics and finance. Most of them are intended for professional researchers and therefore are relatively technical.

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No. 46. T. J. Meeks, "Investment Demand and Bank Portfolio Composition in the St. Louis Equation."

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Pegs and Floats:
The Changing Face of the Foreign Exchange Market

*By Nicholas Carlozzi**

"Dollar Gains Sharply in London." "U.S. Increases Swap Arrangements." "Price of Gold Hits New High."

Such headlines greet readers almost daily on the financial pages of the press. Yet as recently as 10 years ago, these news stories would have been the exception, not the rule. Obviously, international monetary relations have taken on a new look.

During the quarter-century following World War II, the trading nations of the West operated under a largely uniform system of fixed exchange rates for their currencies. But the 1960s saw a series of crises in the foreign exchange market that shook the confidence of international traders and investors in the fixed rate system. And in the early 1970s, a combination of disruptions in commodity markets and large differences among inflation rates in the trading nations made it all but impossible to manage exchange rates as they had been in the past.

The result? Individual nations now choose the exchange rate policies most compatible with their own economic objectives from a variety of options. In spite of the complexity of this new system, it appears to offer a workable basis for international monetary relations in the decade to come.

A BREAK WITH TRADITION

The industrialized nations of the West entered the 1970s with an international monetary system designed at the end of World War II to promote economic recovery. The aim above all was to prevent the economic chaos that had plagued Europe after the previous war, when currency values fluctuated wildly and produced large-scale economic and political dislocation. To achieve this aim, the United States and its allies

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agreed to fix the values of their currencies.

How Fixed Rates Worked. The fixed rate system was negotiated at Bretton Woods in 1944 and embodied in the Articles of Agreement of the International Monetary Fund (IMF), an institution established to monitor the exchange rate practices of member nations. Under this system, IMF members (almost all noncommunist nations) followed a uniform exchange rate policy, keeping their currency values within one percent of an agreed upon par value. Par values, the official prices at which members were prepared to trade their currencies, were set initially in terms of gold. But it became an established practice for the U.S. to state the value of the dollar in terms of gold and for other members to compute parities in terms of the dollar. IMF members (except for the United States) then used their dollar holdings when intervening to keep their dollar exchange rates within the agreed upon margins.

If the price of a country's currency neared one percent below the par value, its central bank would use its foreign exchange reserves (mainly dollars) to buy its own currency in the foreign exchange market, thereby increasing its price. Similarly, if the price of its currency rose toward the upper intervention point, the central bank would sell its own currency (buy dollars) until its price fell. When countries found that intervention involved too large a change in their foreign currency reserves, they typically would change the par values of their currencies (see THE ADJUSTABLE PEG).

This policy of pegging foreign exchange rates in the exchange market became a less viable strategy as financial markets in the developed nations grew and became more tightly linked through international capital flows.[1] As nations began to experience widely different rates of inflation in the 1960s, which produced different interest rates and investment incentives, newly mobile capital began to flow into the nations that had higher nominal interest rates. These capital flows continued until the returns from higher interest rates were offset by increases in exchange costs brought about by adjustments in exchange rates. To the extent that exchange rates were forced toward their bounds, governments had to buy or sell currencies in the foreign exchange market, a process which involved them in ever larger transactions.[2] Ultimately, central banks were called upon to intervene to the tune of *billions* of dollars in the space of a few days. But many nations were unwilling to continue such massive intervention. In the words of one observer, "What the system lacked was both a clear assignment of responsibility for initiating [exchange rate] adjustment and a crisis-proof method of effecting adjustment."[3] The system

[1] In the immediate postwar period most nations restricted international capital flows, making it difficult to convert financial assets denominated in one currency into assets denominated in some other currency. During the 1960s and 1970s, the development of the Eurocurrency market and the loosening of capital controls substantially increased the mobility of capital among the major developed nations. And although some nations continue to enforce capital controls, capital markets are linked more closely today then at any time in recent history.

[2] As international capital markets grew, the magnitude of funds that could be moved cheaply and quickly in anticipation of parity adjustments strained the resources of the central banks and forced them to change exchange parities more often. For example, suppose that the franc price of dollars was approaching its lower intervention point and speculators expected the pressure for the appreciation of the franc against the dollar ultimately to cause a reduction in the franc-dollar parity. Speculators with dollar denominated assets would attempt to trade them for franc denominated assets in anticipation of the parity adjustments. Such speculative flows would place further downward pressure on the exchange rate and require even greater government intervention. The closer the rate to the margin and the more imminent the expected parity change, the larger the resulting capital flows would be and the more difficult the job of intervening to support the current parity.

[3] John Williamson, *The Failure of World Monetary Reform, 1971-1974* (New York: New York University Press, 1977), p. 51.

THE ADJUSTABLE PEG

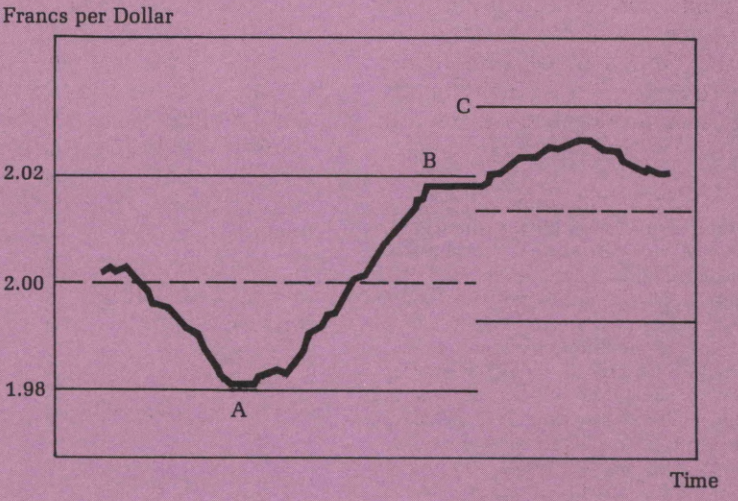
The levels of exchange rates are determined by demands for and supplies of currencies. These demands and supplies arise from private and governmental transactions. Private demands and supplies are occasioned by flows of goods, services, and capital. Governmental transactions in the exchange market are determined by exchange rate policy.

Suppose, for example, that the par values of the U.S. dollar and French franc were $35 and 70 French francs per ounce of gold. Then the franc-dollar parity level (the official price of the dollar in terms of the franc) would be two francs per dollar. Under the adjustable peg the upper and lower intervention prices required by one-percent margins would be 2.02 and 1.98 francs respectively. The French government would intervene in the foreign exchange market to keep the exchange rate (the franc price of dollars) within this range.

Beginning at the exchange parity, a spontaneous increase in private demand for francs would cause the franc to appreciate (the franc price of dollars to fall). If private franc demand continued to increase and the franc-dollar rate fell to the lower intervention point, the French government would begin to supply francs to satisfy the increased demand and keep the rate above the lower limit (Point A in the figure below). The government would sell francs for dollars in the exchange market. If the private franc supply was increasing over time instead, the government would sell dollars for francs to keep the exchange rate below its upper limit (Point B).

With persistent excess franc supply at the upper intervention point, the French government might choose to adjust the parity rather than to keep intervening. An official devaluation of the franc would shift both the parity and the intervention band upward (Point C).

THE FRANC PRICE OF DOLLARS



had achieved its main objective—the postwar economic recovery of Europe and the Far East. But now, clearly, something else was necessary.

The End of an Era. In the absence of an agreed upon program to reform the system, these monetary crises resulted in a series of stopgap measures. One crucial alteration was the action by the U.S. government to halt the conversion of dollar holdings of foreign monetary agencies into gold. Later, in March 1973, after members of the IMF widened the intervention bands (to 2.25 percent) and temporarily allowed the exchange rates of a few nations to move freely in response to market forces (by suspending the parity and removing the intervention requirements), the entire system collapsed. All of the major developed nations allowed their currencies to float and began to look for a successor to fixed rates.

In 1978, after four years of negotiation, the members of the IMF adopted the Second Amendment to the Fund's Articles of Agreement. Unlike the Bretton Woods system, the Second Amendment allows each member to choose from a wide range of exchange rate policies, provided that certain good-faith principles are observed.[4] Each nation is free to determine the degree of exchange rate flexibility that is consistent with the structure of its economy and its domestic economic objectives.

[4]Under the Second Amendment, the members of the IMF are free to follow any exchange rate policy that conforms to three principles: first, exchange rates should not be manipulated in order to prevent effective balance of payments adjustments or to gain an unfair competitive advantage over other members; second, members should act to counter disorderly conditions in exchange markets of a short-term nature; and finally, when they intervene in the exchange markets, members should take into account the interests of other members. The IMF is authorized by the amendment to play a surveillance role and to consult with any member that is suspected of violating these principles. International Monetary Fund, *Annual Report 1977* (Washington: International Monetary Fund, 1977), pp. 45-46.

PEGS AND FLOATS

The design of an effective mechanism of government intervention to limit fluctuations in exchange rates has been an important theme in postwar international monetary relations. Stable rates are assumed to encourage both world trade and investment by reducing the risks of transacting in foreign currencies. But the benefits of increased trade and investment must be weighed against the costs of government involvement in the foreign exchange market. The expense of maintaining foreign exchange reserves and engaging in market intervention is the most visible cost. To it must be added the inefficiencies introduced by capital controls and other restrictions necessary to reduce exchange rate variability.

In the weighing of costs and benefits, different policy choices result from different economic structures and objectives. The developed economies generally find that pegging is inconsistent with their desires to pursue somewhat independent courses in dealing with inflation, employment, and other domestic policy issues. A more flexible policy allows them to make their domestic policy choices with less dependence on the corresponding policies of other nations. The developing nations, with their close trading ties to larger neighbors, are almost alone in finding that pegging is a workable exchange policy. This is partially explained by the fact that they rely on private capital flows to a much lesser extent than developed nations and therefore find them much easier to control. While the exchange rate practices of no two nations are identical, two basic types of policies can be identified—pegging and floating.[5]

Pegging. Any nation that maintains the exchange rate of its currency within a well-

[5]Detailed descriptions of each member's exchange rate policies are available in the *30th Annual Report on Exchange Restrictions: 1979* published by the IMF.

defined range relative to some other currency or group of currencies is classified as a pegger.

Pegging to a single currency is attractive to developing nations whose trade and financial ties are primarily with a single larger trading partner. By pegging the value of its currency to that of its partner, a small nation can reduce changes in the prices of imports and exports that stem from changes in the value of its currency in relation to that of its partner. The result could be greater stability of employment and output in the exporting and importing sectors, which could have a strongly favorable effect on a country's economic development. For example, the nation of Senegal, which trades primarily with France, pegs the value of its currency to the French franc.

Pegging to a group or basket of currencies is an alternative for a small nation with more than one major trading partner. The basket consists of prescribed quantities of foreign currencies in proportion to the different shares of trade the country carries on with its different trading partners. Once the basket is defined, the domestic currency value is calculated using the exchange rates of the foreign currencies in the basket. By pegging the domestic currency value of the basket, fluctuations in export or import prices caused by changes in the exchange rates included in the basket can be averaged out (see THE BASKET PEG). Sweden, for example, uses a basket of the 15 currencies of its major trading partners in the management of its exchange rates.

Many nations choose to peg the local currency value to the Special Drawing Right (SDR), a currency basket defined by the IMF (see THE SPECIAL DRAWING RIGHT overleaf), instead of constructing their own currency baskets. Adopting a standardized basket, such as the SDR, may make sense under any

THE BASKET PEG

Consider the case of a small developing nation with currency unit S. This nation has two trading partners, the U.S. and France, each of which purchases half of its exports and provides half of its imports. In order to reduce variations in the average price of imports or exports caused by exchange rate fluctuations, nation S chooses to peg its domestic currency value to a basket that includes U.S. dollars and French francs. Assume that the rates of exchange (units of domestic currency per unit of foreign currency) of currency S for the dollar and franc are (S/$) and (S/FF) respectively. At the start (S/$) is one, (S/FF) is one-half, and the basket contains one dollar and two French francs. In this case the shares of the domestic value of the basket accounted for by the dollar and franc are equal. The domestic currency value of the basket is defined by the equation:

$$\text{Basket Value} = \$1 \times (S/\$) + FF2 \times (S/FF).$$

Suppose that the S government is committed to maintaining the domestic currency value of the basket within one-percent margins. If (S/FF) rises (scarcity of the franc relative to the S currency) so that the basket value approaches its upper intervention point, the S government must intervene. It can either sell francs for S currency to induce a fall in (S/FF) or sell dollars for S currency to induce a fall in (S/$). Both reduce the home currency value of the basket.

Where imports and exports are received from or shipped to these two trading partners, this basket peg does the best job of stabilizing average export and import prices. Pegging to the dollar or franc alone would not stabilize average prices to the same extent, although some individual prices might be observed to vary less. Since the key to the effectiveness of the basket peg is that it takes trading patterns into account, the definition of the basket must be revised when these relations change.

THE SPECIAL DRAWING RIGHT

The Special Drawing Right (SDR) is an international reserve asset administered by the IMF and used by member governments to settle accounts among themselves. The SDR is a currency basket that comprises prescribed amounts of 16 member currencies. The amounts of each currency included in the definition were fixed as of July 1, 1978, and are those of the 16 members that were the largest exporters of goods and services during the 1972-76 period. The definition of the basket is revised every five years to take changes in trading patterns into account. The quantities of the 16 currencies included in the current basket and the approximate percentage contribution of each to the total value of the SDR (as of June 30, 1978) are:

SDR COMPOSITION

Currency	Amount	Percent
U.S. dollar	.40	33 %
Deutsche mark	32	12.5
Japanese yen	21	7.5
French franc	.42	7.5
Pound sterling	.05	7.5
Italian lira	52	5
Netherlands guilder	.14	5
Canadian dollar	.07	5
Belgian franc	.6	4
Saudi Arabian riyal	.13	3
Swedish krona	.11	2
Iranian rial	1.7	2
Australian dollar	.017	1.5
Spanish peseta	1.5	1.5
Norwegian krone	.10	1.5
Austrian schilling	.28	1.5

of several conditions—if, for example, the trading pattern of the nation is close to that reflected in the SDR or if political considerations make pegging to a single currency or the determination of an appropriate basket difficult. The nation of Guinea, which trades primarily with the United States, Canada, France, Germany, and Italy, pegs its currency to the SDR, in which these nations' currencies are strongly represented.

Floating. Under a managed float, market forces are allowed to determine exchange rate trends over the longer run while government intervention is used to reduce the day-to-day variability of market rates. Some nations follow a policy of leaning against the wind—intervening in order to reduce daily fluctuations in their exchange rates without attempting to adhere to any target rate. Others choose target exchange rates and intervene in order to support them. Even nations that do target exchange rates usually do not reveal their targets. Thus, they discourage speculation against these targets and retain greater flexibility to adjust them.

One way for managed floaters to estimate

Because this asset is a composite of many different monetary units, its value fluctuates with movements in exchange rates. To compute its value in terms of a particular currency, it is necessary to know the exchange rates of that currency against each of the currencies included in the basket. The dollar value of the SDR as of December 31, 1979, is shown below. The quantities of each currency are multiplied by the dollar-per-foreign-unit exchange rate to give the dollar value of each component. The total dollar value for December 31 is reported at the bottom of the third column.

SDR VALUE COMPUTATION*

Currency	Currency Quantity	x	Dollars per Foreign Unit	=	Dollar Value
U.S. dollar	.40		1.00		$ .400
Deutsche mark	.32		.578		.185
Japanese yen	21.		.0042		.088
French franc	.42		.249		.104
Pound sterling	.05		2.22		.111
Italian lira	52.		.0012		.065
Netherlands guilder	.14		.525		.073
Canadian dollar	.07		.856		.060
Belgian franc	1.6		.036		.057
Saudi Arabian riyal	.13		.297		.039
Swedish krona	.11		.241		.027
Iranian rial	1.7		.014		.024
Australian dollar	.017		1.11		.019
Spanish peseta	1.5		.015		.023
Norwegian krone	.10		.203		.020
Austrian schilling	.28		.080		.023
Total					$1.32

*Based upon exchange rates reported for December 31, 1979, in the IMF Survey of January 21, 1980.

a target exchange rate is to follow statistical indicators that respond to the same economic forces as the exchange rate trend. Then, when the values of the indicators change, the exchange rate target can be adjusted accordingly. Among these indicators are differential rates of inflation—different rates of price changes in different nations. Other indicators are levels of official foreign reserves, changes in the level of foreign reserves, and persistent imbalances in international payments accounts. Whatever indicator is chosen, periodic changes in policy are tied to changes in the indicator. Portugal, for example, periodically revises its exchange rates by using an indicator formula based on the inflation differentials between Portugal and its major trading partners.

A Hybrid Policy. Some nations attempt to obtain the benefits of both pegging and floating. Under this mixed arrangement, rather than attempting to manage the float of a single currency, they manage a joint float of several currencies which are tied together by fixed exchange rates. This is a hybrid policy, resembling the fixed rate approach

when relations within the trading group are considered and a managed float when relations between an outside nation and the group are examined. But it requires members of the group to surrender some economic autonomy. Thus a hybrid policy will be most attractive to nations that wish to maintain or foster close economic and political ties with one another.

Such an arrangement is the latest in a series of measures taken by the Western European nations in order to work toward economic integration. Eight European nations have joined the European Monetary System (EMS) joint float, and Britain is considering membership.[6] With one exception, Italy, all members peg their bilateral exchange rates within the same 2.25-percent margin. Foreign exchange intervention to maintain the bilateral rates within the group is conducted in group currencies. Adjustments of the bilateral central rates, or parities, are subject to the approval of the participants. Exchange rates of the group currencies with outside currencies are managed through joint intervention by the participants using reserves of outside currencies.[7]

The members of the EMS expect their cooperative exchange rate policy to develop into a regional monetary system during the next few years. The system would feature a European Monetary Fund (EMF), which would be designed along the lines of the IMF to provide credit for foreign exchange intervention and to establish a forum for consultation on economic issues of common interest.

Whatever policy is chosen, whether a peg, a float or a hybrid (see Appendix), the Second Amendment gives member nations the flexibility to respond to changes in their economic circumstances by making adjustments in their exchange policies.[8] But some dissatisfaction with the behavior of the exchange market under this regime has been voiced. An unanticipated conflict has developed between the desire to pursue independent domestic monetary and fiscal policies and the desire for unrestricted international capital flows.

AUTONOMY VERSUS CAPITAL MOBILITY

One of the arguments proposed during the 1960s favoring a change to flexible exchange rates suggested that this would allow members more policy independence or autonomy. Since 1973, most of the developed nations have chosen to float their exchange rates so that they could pursue independent domestic economic policies. Recently, however, many floaters have found it much more difficult to practice this autonomy than they expected when the reforms were originally proposed. In effect, they underestimated the extent to which international money and capital markets have become linked and the consequences of this capital market integration.[9] Now, for example, a sharp rise in U.S. interest rates tends to be followed by capital inflows, dollar appreciation, and higher interest rates

[6]The current members of the EMS are Belgium, Denmark, the Federal Republic of Germany, France, Ireland, Italy, Luxembourg and the Netherlands.

[7]The EMS also incorporates a divergence indicator, which signals the overall strength or weakness of each currency. Excellent descriptions of the operations of the system are contained in *The Economist*, December 9, 1978, pp. 20-21, and *Euromoney*, January 1979, pp. 44-51.

[8]The current importance of floating exchange rates, however, should not be underestimated. Although fewer than one-third of the members currently float their currencies, IMF calculations indicate that four-fifths of world exports are shipped by these nations. International Monetary Fund, *Annual Report 1978* (Washington: International Monetary Fund, 1978), p. 38.

[9]John Kareken and Neil Wallace describe the consequences of capital mobility, floating exchange rates, and economic autonomy. They conclude that this is not a workable combination of policy objectives. As alternatives they suggest floating rates, capital immobility, and autonomy; or fixed rates, capital mobility, and policy coordination. "International Monetary Reform: The Feasible Alternatives," *Quarterly Review*, Federal Reserve Bank of Minneapolis, Summer 1978, pp. 2-7.

abroad. Given a choice between the pursuit of independent economic policies and the efficiencies of the free flow of capital, national policymakers recently have expressed a desire to coordinate domestic economic policies to a greater extent than in the past.[10]

WHAT'S AHEAD IN THE 1980s?

The evolution of international monetary relations that is likely to occur during the 1980s will take place along a number of fronts. The move toward joint floating and the resulting coordination of the policies of group members can be expected to continue. Even some nations that are not closely linked in a currency group can be expected to cooperate in the determination of their economic objectives to a much greater extent than in the past. And the United States is likely to continue taking an active part in the management of its exchange rates, in contrast to the passive role it played in the Bretton Woods system.

There may be further reforms aimed at controlling the stock of international reserves available to IMF members. These reforms could include the increased use of the SDR as a means of payment among member governments, the possibility of a substitution account to promote the diversification of international reserve holdings, and the introduction of government regulation in the Eurocurrency financial markets.

As innovations in communications and transportation continue to bring nations closer together, it will be necessary for the international monetary system to maintain both its flexibility and diversity. Hopefully, enough of both will be present in order to stabilize and promote the growth of the world economy as effectively as the Bretton Woods system did in the past.

[10]Both Guido Carli and E. M. Bernstein identified the need for greater policy coordination at the October 31 - November 1, 1979 conference on the International Monetary system sponsored by the Global Interdependence Center. Carli stressed the need to cooperate in the creation of international liquidity and the control of the Eurocurrency credit markets. Bernstein emphasized the significance of the moves by the United States on November 1, 1978 and October 6, 1979 to adopt an active exchange policy and to take these external goals into account in the determination of domestic monetary and fiscal policies.

APPENDIX . . .

. . . CURRENT EXCHANGE

The 140 members of the IMF are grouped in the figures below according to the exchange rate policies they followed as of December 31, 1979. On that date, 94 members reported that their exchange rates were pegged and 45 reported that their exchange rates were governed by other policies (floating).*

The pegged group includes all currencies whose exchange rates were maintained within a well-defined range relative to a single foreign currency or a basket of foreign currencies. Sixty of the pegged currencies were tied to a single currency. Forty-two nations pegged to the U.S. dollar, 14 to the French franc, and one to the pound sterling. The currencies of Lesotho and Swaziland were pegged to the South African rand and the currency of Equatorial Guinea was pegged to the Spanish

PEGS

Currency Pegged to

Single Currency					Basket	
U.S. Dollar		£ Sterling	French Franc	Other	SDR	Other Composite
Bahamas	Libya	Gambia	Benin	Equatorial Guinea	Burma	Algeria
Barbados	Nepal		Cameroon	Lesotho	Guinea	Austria
Botswana	Nicaragua		Central African Republic	Swaziland	Guinea-Bissau	Bangladesh
Burundi	Oman		Chad		Jordan	Cape Verde
Chile	Pakistan		Comoros		Kenya	Cyprus
Costa Rica	Panama		Congo		Malawi	Fiji
Djibouti	Paraguay		Gabon		Mauritius	Finland
Dominica	Romania		Ivory Coast		Sao Tome & Principe	Kuwait
Dominican Rep.	Rwanda		Madagascar		Seychelles	Malaysia
Ecuador	St. Lucia		Mali		Sierra Leone	Malta
Egypt	St. Vincent		Niger		Uganda	Mauritania
El Salvador	Somalia		Senegal		Viet Nam	Morocco
Ethiopia	Sudan		Togo		Zaire	Norway
Grenada	Surinam		Upper Volta		Zambia	Papua New Guinea
Guatemala	Syrian Arab Republic					Singapore
Guyana	Trinidad & Tobago					Solomon Is.
Haiti	Venezuela					Sweden
Honduras	Yemen Arab Republic					Tanzania
Iraq	Yemen People's Dem. Rep.					Thailand
Jamaica						Tunisia
Korea						
Lao People's Dem. Rep.						
Liberia						

RATE POLICIES

peseta. Fourteen of the members that pegged maintained the value of their currencies in terms of a basket defined by the SDR, and twenty adopted other basket definitions.

Thirty-four of the 45 members that did not peg intervened at their own discretion to limit fluctuations in their otherwise floating exchange rates. Three members used economic indicators to determine the target levels of their exchange rates. And eight participated in a cooperative exchange arrangement (the European Monetary System).

*As reported by the IMF Treasurer's and Exchange and Trade Relations Departments. Information concerning the exchange arrangements of Democratic Kampuchea (Cambodia) is not available.

FLOATS

Float Governed by

Indicators	Cooperative Exchange Arrangements	Other	
Brazil	Belgium	Afghanistan	New Zealand
Colombia	Denmark	Argentina	Nigeria
Portugal	Federal Republic of Germany	Australia	Peru
	France	Bahrain	Philippines
	Ireland	Bolivia	Qatar
	Italy	Canada	Saudi Arabia
	Luxembourg	China (Taiwan)	South Africa
	Netherlands	Ghana	Spain
		Greece	Sri Lanka
		Iceland	Turkey
		India	United Arab Emirates
		Indonesia	United Kingdom
		Iran	United States
		Israel	Uruguay
		Japan	Western Samoa
		Lebanon	Yugoslavia
		Maldives	
		Mexico	

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