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

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John Gruenstein

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PEGS AND FLOATS: THE CHANGING FACE OF THE FOREIGN EXCHANGE MARKET

Nicholas Carlozzi

. . . The nations of the world now have a variety of exchange rate policy options.

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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?

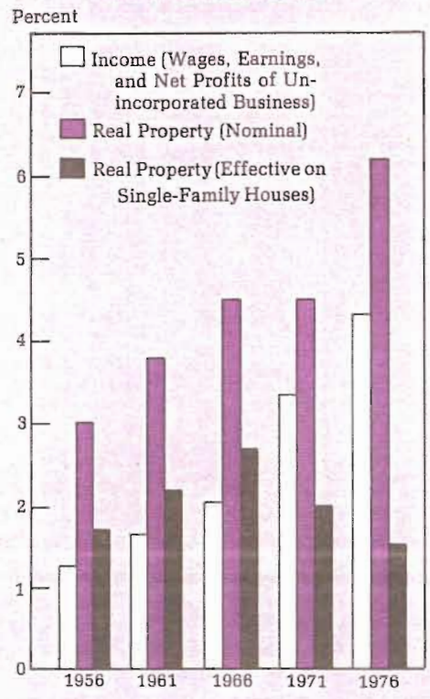
While predicting how large an impact future tax rate changes will have on employment is a chancy business, clearly they will have some impact, and that impact will be related to the size of the change. Thus the city has little choice but to estimate as closely as possible how large a tax increase it 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.

MOST TAX RATES HAVE RISEN



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.

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