THE ANTI-INFLATIONARY EFFECTIVENESS OF THE CORPORATE INCOME TAX

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In industrial countries a large proportion of economic activity is organised by corporations and therefore profits constitute a potentially large tax base. The importance of this sector for such purposes in developing countries is less apparent, although the taxation of corporations is increasingly becoming an integral part of their tax structures.

The level of corporate income is related to the phases of the economic cycle. Although there may be great diversity among various firms in the way that their profits fluctuate, total profits fluctuate directly with changes in economic activity. Thus, the yield of the corporate income tax rises in inflationary periods, and declines during recessions. However, since corporate profits as a whole fluctuate more widely than national income, the tax is supposed to be one of the most flexible.

The corporate income tax plays an important role in economic stabilization. Higher tax rates eliminate profits, and therefore the ability of firms to make expenditures on plants and equipment. This decreases demand and the pressure on the price level. Corporate taxes restrict the available funds for financing new investment and moreover they check investment because they reduce the expected return. However, the extent to which investment is influenced by taxes depends on whether these taxes are considered as temporary or not. Moreover, in an extensive period of inflation, even high taxes do not affect certain types of investment.

However, firms, in general, are very reluctant to seek outside funds and even

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when they decide to do so they may find it difficult to get funds on favourable terms. In developing countries, in particular, the major, if not only source of finance for firms, is their own retained profits, and therefore, it is obvious that the influence of the tax is substantial. Thus, an increase in tax rates is a very effective means in inflationary periods, especially if it is utilized in coordination with restrictive credit policy. The effect is obviously greater if the issuing of new securities is also eliminated.

The tax also limits the ability of a firm to distribute profits to its shareholders whose spending power is therefore affected. A reduction in dividend payments, however, does not cause an equivalent decrease in stockholders disposable income because the amount of money stockholders receive is subject to the personal income tax which has high marginal tax rates.

However, the above discussion concerning the anti-inflationary effectiveness of the corporate income tax does not take into account a very important factor, namely the shifting of the tax. At this point, therefore a brief discussion of the concept of shifting is necessary.

The tax is levied on corporations and is meant to affect income accruing to equity capital. Thus, any part of the tax that is actually paid by persons outside the corporations is considered to be shifted.

The tax may be considered as fully shifted (or 100 % shifted) if a change in the relative statutory tax burden on a firm's profits leads to changes in the firm's behaviour, such that the firms' post-tax profit level remains unchanged. The tax is not shifted at all (zero % shifted) if the firm's after tax profit fully reflects the increased tax burden. The tax is partially shifted when the level of shifting is between zero per cent and 100 per cent, and it is overshifted when a firm's post-tax profits are, c e t e r i s p a r i b u s, higher after a tax increase than they were before. The traditional economic view of corporate income tax incidence was that shifting would not occur. The empirical tests however leave the question of shifting unanswered, since estimates have varied from virtually no shifting to over 100 per cent shifting.

If the tax cannot be shifted in the short term, the corporate rate of return on investment is adversely affected. Corporate investment in turn, is reduced and therefore effective demand becomes less than supply. Hence, income output and employment fall except in the case of flexible prices. If, however, the tax is fully shifted on to consumers, the rate of return does not decrease while the prices of corporate goods do increase. Consumers then purchase smaller quantities of goods, so that corporations are left with unsold goods. But if corporate profits are computed on the basis of the prevailing higher prices they lead to an increased corporate rate of return. Thus, on one hand corporations are induced to in-

vest more while on the other hand they are left with unsold goods which is an incentive to cut production. There can be no definite comment on such a situation as it depends on the strength of the two factors. Finally, if there is a partial shift of the tax, the corporate rate of return not only declines but the prices of the goods also increase. Here, the situation is a mixture of the two previous alternatives, i. e. full shifting and no shifting at all. Thus, if at least a part of the tax is shifted the tax increase leads to price increases. It is very important to realise this since it is in inflationary periods that it is desirable, for counter-cyclical policy purposes, to have an increase in tax rates. At the same time however, during such periods corporations can shift the tax forward more easily, exploiting their market power.

In general it can be said, that the traditional conclusion that corporate tax rates increases are anti-inflationary, is based on two strict assumptions: (a) there is no shifting of the tax by the corporations, and (b) there are flexible prices.

Assuming that corporate income tax rates increase in period t′ and that corporations earn the same amount of gross profits in that period as they did in the previous period t, we find the following alternatives. First, if the additional tax is not shifted at all the net profits of the corporations in period t′ are lower than they were in period t, or $NP_t < NP_{t'}$. If the additional tax is shifted by 100 per cent, net profits remain unchanged, or $NP_{t'} = NP_t$. Finally, if the tax is shifted by more than 100 per cent, net profits in period t′ are higher than they were, or $NP_{t'} > NP_t$.

By definition we have :

$$NP_t = GP_t - R_t GP_t \qquad \ldots\ldots\ldots (1)$$

$$NP_{t'} = GP_{t'} - R_{t'} GP_{t'} \qquad \ldots\ldots\ldots (2)$$

where

GP_t = gross profits in period t
$GP_{t'}$ = gross profits in Period t′
R_t = effective tax rate in period t
$R_{t'}$ = effective tax rate in period t′

It follows from the above discussion that $NP_{t'}$ can be higher, equal, or lower than NP_t depending on the degree to which the tax is shifted. Therefore if q represents the fraction by which the additional tax is shifted, it can be shown that :

$$NP_{t'} = NP_t - (1-q)\ (R_{t'} - R_t) GP_t \qquad (3)$$

Solving equation (2) for $GP_{t'}$ we get

$$GP_{t'} = NP_{t'} + R_{t'} - GP_t \qquad (4)$$

Substituting (3) into (4) we get

$$GP_t' = NP_t - (1-q)\ (R_t'-R_t)\ GP_t + R_t'.GP_t' \quad (5)$$

Since $GP_t' = GP_t + \Delta GP$, equation (5) can be written as

$$GP_t + \Delta GP = GP_t - R_t.GP_t - (1-q)\ (R_t'-R_t)\ GP_t + R_t'GP_t'$$

or

$$\Delta GP = GP_t - GP_t - R_tGP_t - (R_t'GP_t - R_tGP_t - qR_t'GP_t + qR_tGP_t) + R_t'GP_t' \quad (6)$$

or

$$\Delta GP = GP_t - GP_t - R_tGP_t - R_t'GP_t + R_tGP_t + qR_t'GP_t - qR_tGP_t + R_t'\ (GP_t + \Delta GP) \quad (7)$$

Equation (7) reduces to :

$$\Delta GP = qR_t'GP_t - qR_tGP_t + R_t\Delta GP$$

or

$$\Delta GP - R_t'\Delta GP = qGP_t(R_t'-R_t)$$

and

$$\Delta GP\ (1-R_t') = qGP_t(R_t'-R_t)$$

or,
$$\frac{\Delta GP}{GP_t} = q\ \frac{(R_t'-R_t)}{(1-R_t')} \quad (8)$$

Equation (8) shows the rate of increase of gross profits that is due to the increase in the tax rates in period t'. It is obvious that the increase in profits depends on the value of q and will come from an increase in the money value of sales. Assuming that the relationship between profits and sales is given by

$$GP = kS$$

where S stands for sales, and that :

$$\Delta GP = \Delta kS$$

we get :
$$\frac{\Delta GP}{GP} = \frac{\Delta kS}{kS} = \frac{\Delta S}{S} \quad (9)$$

Assuming further that the supply of products produced by corporations is perfectly inelastic in the short run, prices of the goods sold will increase at the same rate as sales. Thus, equation (8), shows the percentage increase in prices resulting from an increase in corporate tax rates.

Based on the above analysis and using assumptions on various degrees of shifting we can calculate the percentage increase in prices in Greece resulting from the 1975 increase in the tax rate. The findings are :

% of shifting of the tax	% increase of prices
25	2.08
50	4.16
75	6.25
100	8.33
125	10.41

This is not the only limitation to the effectiveness of the corporate income tax as an anti-inflationary tool. Many firms, for instance, although having to pay higher taxes, may be motivated to spend more. This paradox may be explained by the fact that some kinds or business spending are tax-exempt, being deductable from taxable income in the year when made. Examples of these kinds of spending are maintenance and repair of plant and equipment, research outlays and so on. It is to the benefit of the firms to undertake these expenses when tax rates are high because they are actually paid largely with funds that otherwise would have gone as tax. To this extent, incentives for curtailing spending are undermined. Moreover, while an increase in the rates of the corporate income tax will have an unfavourable influence on the availability of funds and the anticipated rate of return, it is not likely that rate changes will transform a profitable investment into an unprofitable one. Thus, at the most a rate increase can only be a weak disincentive and no general decrease in private investment is likely to follow.

The return on a new long-term investment, or the return on an investment of an intermediate durability are expected to be subject to the regular tax. Therefore, if the increase of the rates is announced to be, or is expected by entrepreneurs to be, temporary, it will prove much less effective than a permanent increase. This is because once the inflationary period is over, firms will expect to be subject to the previous lower tax rates and therefore the outlook of investments undertaken when high rates were in effect will not deteriorate much.

Whatever the effectiveness of the corporate income tax during periods of inflation or depression, a vital part of the discussion has still been left out. This is the question of what happens in the intervening phases of fluctuations. It is possible if the rates of the tax remain unchanged during these intervening phases, that the functioning of the tax will not necessarily be consistent with the objective of stabilizing the economy. In the recovery phase, for instance, the tax will absorb funds which could give an impetus to the expansion of the economy. Similarly, in the recession phase, when investment could be encouraged by more funds, the corporate income tax will be less desirable than a deficit. Thus, the tax must be supplemented at some critical junctures by rate adjustments.

A very important consideration refers to the time lag between the change in

the rate of the tax and the impact of the change on price and investment levels.

The effect of a change in tax rates on a company's profits is determined not only by the extent but also by the timing of shifting. The shifting of the tax, after a change in rates, is very likely to be rapid, irrespective of whether the tax increase is taken as a signal in an industry for all round price increases or whether a single company makes an attempt to recoup the portion of gross profit it estimates it will lose. In the first case it is result of an impulsive reaction in a period of implicit collusion immediately after the tax increase. In the second case, the single company is forced to react quickly if it wishes to recoup the tax increase, because the tax increase applies not only to profits earned at the time but also to profits earned in the past. The only possible delay between tax increases and higher prices can be the time taken to decide on the size of the price increases.

As far as investment is concerned, we can discern two possible effects. The first may be called the «profitability effect» and is the reduction in investment that results from a reduction in the expected rate of return. The «feasibility effect» on the other hand, is the reduction in investment that is due to a reduction in the available funds. Bearing this distinction in mind, it can be said that the length of the time lag between the change in rates and its effect depends on whether the effect operates through the profitability or feasibility effects.

It is obvious that there is no effect on investment if firms consider the post tax rate of return and the tax increase is not enough to reduce the post tax return to a level where the range of attractive investment is cut. Moreover, investment is unaffected by the change in the tax if firms consider the return on investment before tax and can find attractive outside finance.

At this point a separate discussion about the lags inherent in the operation of the feasibility and profitability effects is necessary.

As regards the profitability effect, a firm, in order to be able to forecast post tax rates of return on investment, must forecast the rate of tax which will be in operation when the returns to an investment accrue. It is likely that most, if not all, companies do not make sophisticated forecasts of future tax rates and indeed assume that the present tax rates will not change. This is particularly likely in the case of Greece where corporate income tax rates have very rarely been changed. Therefore, it is probable that the profitability effect that results from a change in tax rates will not operate before the change in rates comes into effect.

The profitability effect operates through the desired level of capital stock. A change in the desired level of capital stock will force a company to adjust its investment programme until it is compatible with the new level of capital stock. Such an adjustment, however, takes some time and varies from company to company

and from industry to industry. Moreover, the adjustment will probably be spread over a number of years.

The time lag inherent in the operation of the feasibility effect is that of the delay between the announcement of the change in the tax rate and the collection of taxes levied at the new rate. The length of this lag depends on whether firms keep financial records or nct.

In the case of firms that do not keep accounts the lag depends on the date the Budget is announced. For firms that keep financial records the delay between the announcement of a change in the tax rate and the collection of tax levied at that rate is different. In this case, the time lag depends on the accounting dates of each firm in question, the announcement date of the new rate, and the length of time elapsing between the end of a firm's accounting year and the assessment.

The relationship of the time lag involved between announcement and collection of the tax with the operation of the feasibility effect is further complicated by the fact that some firms put aside reserves for tax before the payment of the tax takes place. This action is taken particularly by firms with high profits and consequently high tax levels. Firms with a seasonal demand for their products are also likelty to act in such a way. However, it seems logical to assume that the majority of firms in Greece do not put aside reserves and therefore do not experience the feasibility effect until the tax is actually paid. For those firms that do put aside reserves, the feasibility effect operates some time between the tax rate announcement and the payment of the tax.

Consider now the effect that changes of dividends have on consumer spending. To find the effect that changes in profits after taxes have on stockholders' dividends the following equation was estimated[1]

$$D = 284.41 + \underset{(0.0100)}{0.2820}\ NP \qquad (10)$$

$$R^2 = 0.983$$

$$D\text{—}W = 1.373$$

where D stands for dividends and NP for profits after tax.

Equation (10) shows that for every 100 Drs increase in profits after tax, there is an increase in the amount of dividends by approximately 28 Drs. Taking into consideration that those receiving income from dividends are mainly, if not exclusively people of the higher income class taxed by high income tax rates, we may assume that an increase in dividends by 28 Drs will lead to an increase in the personal income tax the stock-holders must pay by approximately 10 Drs. Thus, the

1. Equation (10) refers to domestic sociates Anonymes only. Period 1960 - 1974.

change in stockholders' disposable income is approximately 18 Drs for each 100 Drs change in corporate income tax. Finally, if we take into account that the marginal propensity to consume is rather low for those individuals receiving dividends, we may conclude that an increase in tax will reduce the growth of consumer spending by a very small percentage. Thus, it is obvious that the effects on consumer expenditures would be greater if instead of increasing the rates of the corporate income tax in an inflationary period, the rates of, say, the personal income tax or a sales tax were increased.

The degree of flexibility of the corporate income tax depends upon the way income is defined for tax purposes. Important considerations here are the procedures followed for determining depreciation allowance, valuation of inventories, the rate structure, investment allowances, and the extent to which losses in one year can be offset against profits in other years. The above factors affect tax liabilities over the cycle as well as the timing of liabilities and we shall consider them with reference to this influence.

The last of the above stated considerations relates to the treatment of business losses and more specifically to the provisions for the carrying of losses through time. However, in discussions about loss carry-overs a distinction is made between loss carry-forward and loss carry-back.

The loss carry-forward reduces taxes in the years following the loss when business conditions are improving. The loss carry-back, on the other hand, allows losses to carry-back against profits of prior years and receive refunds of taxes already paid. Thus, a loss carry-forward decreases variability of taxes liabilities, while the carry-back produces negative tax liability for time during depression, years. The carry-back has a desirable effect on liquidity during depressions as have the other arrangements that increase the built-in flexibility of the corporate income tax, and therefore it is apparent that loss carry-backs are more desirable for stabilization than loss carry-forwards. However, loss carry-back requires the recomputation of previous years' taxes. The non-existence of the carry-back method is, therefore, an administrative convenience, especially in countries where the administration is not efficient. Because of this, a carry-forward is preferable as it does not require holding open or reopening old tax returns. Moreover, the loss carry-back discriminates against new firms because it favours established and declining businesses only. Thus, the carry-forward is necessary for reasons of equity. Finally, the refund owed, due to the carry-back is only paid after a considerable delay because of the auditing and the other administrative steps, and probably by the time the refund is paid, the firm may already be earning taxable profits again. A carry-forward, on the other hand, is considered by the corporations themselves when returns are filed and therefore the tax payment is adjusted accordingly.

Nevertheless, carry-forward is undoubtedly disadvantageous to the compensatory effects of the tax, since, if inflationary conditions exist, the carry-forward of business losses is destabilizing. The carry-back, on the other hand, increases the variation in the flow of funds for the government but it stabilizes the flow of funds for the firms and therefore contributes to economic stabilization.

In Greece, as in the other South European countries, losses cannot be carried-back but they can be carried-forward and offset against future profits arising within two years from the time the loss occurred. This provision tends therefore to restrict the built-in flexibility of the tax since past losses can be offset against profits in periods of rising income with the result that liabilities are reduced at a time when compensatory finance would normally require an increase. Hence, the adoption of the carry-back method could help to combat depressions. Further research, however, would be necessary in order to determine the ideal length of the period and to examine the administrative difficulties of the method. A logical proposition would be to combine both carry-forward and carry-back. While carry-back would be favourable for stabilization purposes, a longer carry-forward for new firms would compensate for the discriminatory nature of the carry-back.

Accelerated depreciation allowances have been employed in order to remove obstacles to private investment and prevent the tax rates interfering too much with certain types of enterprises. It would be contrary to the national objective of economic development if the tax discouraged the growth of the corporate sector, for we have learned that this sector has been a primary vehicle for the rapid growth of the western industrialized nations. Thus, while increasing tax revenues may be sought from corporate sources, the tax structure has to be so designed as to serve the respective governmental policies regarding need for private investment.

However, this use of depreciation allowances raises the question of the relation of policies promoting development to those that are intended to achieve stabilization. Obviously a mere stabilization of the economy is not enough and a steady rate of growth in per capita output is wanted. Rapid expansion has been a characteristic of Greece in the last two decades and therefore countercyclical policy should aim to dampen fluctuations around an upward trend. Under these circumstances, one may wonder whether measures taken to reduce the amplitude of the swings will reduce the rate of growth achieved, and vice versa.

However, since depreciation allowances are calculated in Greece on the basis of the original cost of aquisition of the assets, they create an element of automatic flexibility in the corporate tax system of the country. Obviously, the opposite would happen if the calculation was based on the current or replacement value. According to the former system, during inflationary periods the money values of

assets increase while depreciation allowances remain at a low level so that taxable income is to this extent greater. Similarly, during a depression, depreciation allowances remain high and therefore taxable profits are reduced. On the other hand, according to the method of replacement cost depreciation, larger offsets against profits in inflationary periods reduce tax liabilities so that the results are contrary to what contercyclical fiscal policy requires. Thus, for stabilization purposes it is appropriate to accelerate normal allowances in depression and reduce or postpone them in inflationary periods. However. although there seems to be a clear relationship between depreciation allowances and investment, the effect of these allowances on the stabilization of the economy is not as clear as stated above. If, for instance, depreciation allowances increase savings and not private investment, the effect in a case of deficient aggregate demand will be depressing. In such a case increased public expenditure may be a more effective stimulus to recovery.

Another consideration refers to the method of evaluating invertories. Two are the most popular methods that can be used for this purpose. There is the FIFO, or first-in-first-out method, in which the goods are valued at their price when they entered inventories and it is assumed that goods are sold in the order of their acquisition. The opposite is assumed by the LIFO, or last-in-first-out method. Under the first method, the discrepancy between assumed cost of goods sold and replacement cost becomes important in periods when prices change rapidly. The second method, on the other hand, reduces the delay between changes of the cost of goods sold. If, however, prices fall during a recession, reported profits and tax liabilities fall more rapidly if the FIFO method is adopted. To this extent, LIFO clearly reduces the built-in flexibility of corporate tax liabilities.

Any tendency of firms to maintain dividend payments can influence the flexibility of the corporate tax base as well. If dividends are maintained in years of depression, a higher proportion of corporate income is distributed and the base of the corporate income tax will be reduced. However, it should be pointed out that if a higher proportion of profits is distributed, the fraction saved will probably be far above the marginal propensity to save of the community as a whole. In addition to that, a tendency to maintain dividends can also affect the liquidity of firms in a manner contrary to the objectives of countercyclical policy.

The degree of built-in flexibility depends also on the rate of the tax. The corporate income tax is traditionally not progressive. In Greece the tax is not only a flat-rate one, but the various provisions enjoyed mainly by big enterprices add some elements of regressivity to the system.

Graduation of the corporate income tax would obviously increase its built in flexibility. The graduation could be done according to the size of net income

or to the rate of return on investment. However, graduation of the tax on the basis of the size of profits would not satisfy the equity criterion because differences in the optimum size of firms in various industries or even the number of stockholders are not taken into account. On the other hand if the graduation was made according to the rate of return, differences in risk would be ignored.

The time lag between the earning of profits and the payment of tax is considerable in the case of the corporate income tax. However, the effect of any time lag in delaying the effects of the tax on spending behaviour is obviated to the extent that firms make provisions for future tax payments by setting aside tax reserves out of current income.

The above discussion implies that the existing degree of built-in flexibility of the corporate income tax yield is due almost entirely to fluctuations in the size of the base rather than to automatic changes in effective rates. However, it should be noted here that there is no tax base flexibility in the sense that the proportion of corporate income liable to the tax changes over the cycle. There is base flexibility in the sense that the volatility of the profits base is high, i. e. there is a comparatively wider percentage variation in the base in relation to GNP.

It should be pointed out here that the volatility of the base is itself a measure of the seriousness of the stabilization problem and as such is hardly advantageous. However, from the standpoint of the sensitivity of yield the volatility of the tax base by its very nature makes the tax stabilizing.