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## AN EFFECTIVE WAY OF COORDINATING TAX AND INCOME POLICIES

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### Abstract

This paper intends to demonstrate the necessity of coordinating the tax and incomes policies and to suggest an effective way to accomplish this. We start by showing, specifically, how taxes on the one hand and wages - prices on the other are interrelated. There follows a calculation of wage multipliers, based on the 1988 tax schedule for personal income tax (P.I.T) in Greece, as well as of the required wage increases for each income bracket in order to guarantee that for 1989 the real disposable income (R.D.I) of wage-earners does not deteriorate. Next, the impact of P.I.T on wages is estimated using wage equations. Finally, we present a workable mechanism to achieve the coordination of tax and incomes policies in practice. In this way we hope to have given a satisfactory answer to a hitherto unsolved problem.

### 1. INTRODUCTION

This paper intends to demonstrate the necessity of coordinating tax and incomes policies and to suggest an effective way to do this by showing, specifically, how taxes on the one hand and wages and prices on the other are

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interrelated. In many countries political decisions concerning tax and incomes policies are usually made independently from each other and this results in discrepancies between them. Naturally, such discrepancies render these policies less effective than they would otherwise be and consequently cause wide dissatisfaction. The coordinated implementation of tax and incomes policies leads to fairer taxation, more effective control of inflationary pressures and to a reduction of the fiscal drag.

In this paper an analysis is attempted regarding the need to coordinate incomes and tax policies. There follows a calculation of wage multipliers, based on the 1988 tax schedule for personal income tax (P.I.T) in Greece, as well as of the required wage increases for each income bracket in order to guarantee that the real disposable income (R.D.I) of wage-earners does not deteriorate in 1989. Next, the impact of P.I.T on wages is estimated using wage equations. Finally, we present a workable mechanism for achieving tax and incomes policy coordination in practice.

The methodology used may be considered interesting, while the findings obtained have several economic implication.

## 2. THEORETICAL BACKGROUND

### 2.1. The necessity of coordinating the Tax and Incomes Policies

Wage increases and personal income tax (P.I.T) reductions are two faces of the same coin, since both aim at increasing disposable income.

The coordination of tax and incomes policies may be useful not only for the economy as a whole, but for workers and the government as well. Especially, during inflationary periods (mainly cost - inflation), an appropriate P.I.T policy is a necessary part of incomes policy. This may have a positive effect on: labour costs, competitiveness of domestic products (given that demand inflation, even when it is perceptible, takes place with a certain time lag), productivity and employment.

A decrease in the real disposable income (R.D.I) of employees may well be avoided through a deliberate coordination of tax and incomes policies and, specifically, through an appropriate combination of wage increase controls and a decrease of the tax burden on personal incomes. Moreover, worker - employer conflicts will they diminish and labour costs, directly related to inflationary

pressures<sup>1</sup> will be reduced. Finally, output and employment will be given a boost<sup>2</sup>. When the rate of inflation of the current year is expected to reach a certain level, in order for employees to maintain their R.D.I, at least at the level of the previous year one of the following possible courses of action may be undertaken:

- i) An increase in nominal wages, at least equal to the rate of inflation, may take place, so that gross income does not decrease. Moreover, there may be an additional wage increase compensating for the loss of income due to the progressivity of the tax schedule, so as to maintain employees' R.D.I at least at the same level (without any change in the tax schedule or income allowances). Any further wage increase (e.g. due to an increase in productivity) would imply, of course, a substantial increase and not only maintenance of R.D.I, at the same level.
- ii) There may be no wage increase, but a reduction of P.I.T (reform of the tax schedule and income allowances).
- iii) A combination of nominal wage increase and tax reductions.

It is obvious that when the rate of inflation is very low, employees need not ask for a wage increase unless there is an increase in their productivity or a rise in P.I.T In the latter case, any wage increase will motivate the mechanism of price increases (tax-push wage inflation) and such increases will vary depending on the sector involved. Accordingly, if a given taxpayer is an independent professional, he is given the opportunity to increase his earnings by raising his fees and to manage to shift the tax increase to prices. On the other hand, if he is a wage-earner, he will attempt to increase his wages through negotiations. Subsequently employers (depending on the market conditions for their products) will shift the tax increases to prices (tax-push price inflation).

The theoretical studies on the subject do not pay much attention to the taxes - wages - prices<sup>3</sup> spiral. However, many empirical studies have shown that P.I.T changes affect the claims of workers for higher wages<sup>4</sup> and, finally the

1. When the Minister of Finance in Britain introduced the 1977 budget, he declared that: "the key of the success of a one digit rate of inflation rate is the coordination of the tax policy of the current year with the income policy of the next year". See, also, Bondonio p. (1981) p. 49, and Seidman (1978), p. 23.

2. Corden W. & P. Dixon (1980), pp. 209-221.

3. Hansen B. (1967), p. 27.

4. See, Auld and Brennan (1968), p. 520, Pitchford and Turnovsky (1975), p. 272, Auld D. (1974), p. 147, Wilkinson F. & Turner M.A. (1975), Agapitos G. (1976), p. 236, Blinder A. (1973), Bruce C.T. (1975), and Johnston J.-M. Timbrell (1973).

level of prices, as well as the work effort. Thus tax increases encourage inflationary pressures (tax-push price/wage inflation), mainly because wage bargaining is based on net real (after tax) income.

It should be noted that a lot of theoretical supporters of the Keynesian view question the impact of P.I.T on wages. This is because they start from the assumption that P.I.T increases lead to a reduction of disposable income and in turn have a favourable impact on the inflationary process. However, even if this is accepted, it does not constitute a suspending factor keeping employees from demanding the maintenance of their R.D.I<sup>5</sup>. Moreover, the above authors do not take into consideration cost-push inflation<sup>6</sup> which appears to run at a faster rate and persist longer than demand/pull inflation.

The need to coordinate incomes and tax policies emerges mainly from the progressivity of P.I.T. In the case where the tax scheme is not a progressive but a proportional one the average would be equal to the marginal tax rate (i.e.,  $t_a = t_m$ ) and this relation would not be affected by the fluctuations in the rate of inflation. Due, however, to the progressivity of the tax systems any increase in wages is usually taxed, depending on the taxpayer's income bracket and the size of his wage increase, at a higher marginal tax rate. This results in an increase of the average tax rate, but not accompanied by a rise in the tax payer's real taxable income. The magnitude of the increase of the average tax rate depends on the initial level of the taxpayer's income, on the nature of his income, on the size of his family and finally, on income allowances or tax credits. This may lead to a decrease of the taxpayer's R.D.I, when his wage increase does not exceed the change in prices.

## 2.2. Wage multipliers and income tax schedule

It is obvious, therefore, that when there is inflation, the necessary increase in gross nominal wage that should take place in order for the employees to enjoy the same **R.D.I** depends on the marginal tax rate at which their additional income is to be taxed.

5. Tanzi V. (1980), p. 131.

6. We should note that, especially in the private sector, when P.I.T. increases and employees manage to increase their wages, a rise in the real labour cost will take place. Then, the firms, in order to keep their real profits at the same level, will increase the prices of their products. This has well-known negative consequences for the economy. Thus the P.I.T. in this case does not differ from a consumption tax.

Thus, we have the relationship:

$$\frac{W_0(1-t_a)}{P_0} = \frac{W_0(1-t_a) + \Delta W(1-t_m)}{P_1}$$

and then, 
$$\frac{W_1 - W_0}{W_0} = \frac{P_1 - P_0}{P_0} \left( \frac{1-t_a}{1-t_m} \right) \quad \text{or} \quad \frac{\Delta W}{W_0} = \frac{\Delta P}{P_0} \left( \frac{1-t_a}{1-t_m} \right) \quad (1)$$

The coefficient in the parenthesis is the Wage Multiplier<sup>7</sup> which shows that an increase of R.D.I for the higher income brackets is possible only if  $\dot{W} > \dot{P}$ . This is due to the changes in the marginal and average tax rates as income increases<sup>8</sup>.

From the above relationships one may note that a decisive factor for the determination of the necessary wage increase is not only the average tax rate but the marginal tax rate as well. Thus, we may conclude that, with  $t_a$  given, the higher the values of  $\dot{p}$  and  $t_m$ , are the greater is the required percentage increase of nominal wage.

Therefore, the magnitude of the tax effect depends on the level of income.

### 3. THE STATISTICAL FINDINGS

#### 3.1. General remarks

The statistical results of this work give answers to three key problems relevant to a workable incomes and tax policy scheme:

- (a) Measurement of the impact of personal income tax up on wage formation through the testing of a wage equation based on Greek statistical data for the period 1970–1985.
- (b) Calculation of the wage multipliers, used as a basis to determine the wage increases required (for each income bracket) to offset price increases so that R.D.I levels in 1989 may remain at least at the 1988 level.

7. The wage multiplier is the inverse of the elasticity of net wage relative to gross income. This may be considered to be an indicator of the degree of tax progressivity.

8. Lundberg E. (1953), p. 99, Bondonio P. (1981), p. 49, Matthiessen L. (1973), p. 49, and Tanzi V. (1980), p. 133.

- (c) Application of the mechanism for the coordination of tax and incomes policies in practice.

### 3.2. Measuring the effect of the P.I.T on wages

In order to measure the impact of personal income tax on wages and salaries we tested a wage equation in which, beside the main usual explanatory variables of wage rate or wage earnings (prices, productivity and minimum wage rate), we included the tax variable as well. The main estimated equations in Levels and first Differences form are the following<sup>9</sup>:

$$W_1 = -246.7 + 0.90P_{t-1} + 0.25T + 2.1PR_1 \quad (2)$$

(3.4)            (3.5)    (5.9)

$$SE = 11.1, \quad \bar{R}^2 = 0.999, \quad D.W = 2.0$$

$$W_2 = -114.7 + 1.1P_{t-1} + 0.18T + 0.26W_t + 0.56PR_2 \quad (3)$$

(3.0)            (1.9)    (2.9)    (1.2)

$$SE = 14.2, \quad \bar{R}^2 = 0.999, \quad D.W = 1.6$$

$$\Delta W_1 = -1.7 + 1.2\Delta P_{t-1} + 0.17\Delta T + 2.0\Delta PR_1 \quad (4)$$

(4.6)            (2.5)    (1.7)

$$SE = 15.2, \quad \bar{R}^2 = 0.960, \quad D.W = 2.3$$

$$\Delta W_2 = -10.5 + 1.6\Delta P_{t-1} + 0.11\Delta T + 0.19\Delta W + 2.1\Delta PR_2 \quad (5)$$

(5.9)            (1.6)    (3.0)    (1.8)

$$SE = 14.9, \quad \bar{R}^2 = 0.978, \quad D.W = 2.0$$

where,  $W$  = Minimum wage rate,  $W_1$  = average wage rate (for the whole economy)

$PR_1$  = average productivity (for the whole economy),

$W_2$  = average wage earnings,

$PR_2$  = average productivity (all in main manufacturing industry),

9. The figures in brackets are the t statistics. It should be noted that the detailed derivation of variables and the complete time series of all statistical material are available on request from the author.

T = Personal income tax & social insurance contributions,  
 P = general consumer's price index ( $P_t^* = \lambda P_{t-1}$ ).

We may argue that the estimates are consistent with the a priori theoretical consideration (e.g., expected sign and magnitude), the standard errors are usually small and the explained proportion of variation in the dependent variables is high. Regarding the contribution of the tax variable in the explanation of wages, we can see from the estimated equations that it appears with a positive sign, which means that the tax affects the formation of wages and salaries. This indicates that tax increases encourage wage inflation.

### 3.3. Calculation of wage multipliers and required wage increase for maintaining real disposable income unchanged

Using relationship (1) we calculate the wage multipliers bases on the 1988 tax schedule and then, taking into account the expected rate of inflation and assuming that both the marginal and average tax rates remain the same (see Table 1), we estimate the wage increases required for 1989 in order for the wage earners to maintain at least the same real disposable income as in 1988. From Table 1 we can see that the wage multipliers are between 1.00 and 1.24. As it was expected, the low values of the wage multipliers correspond to low incomes and the high values to large incomes, simply because the tax is progressive. The development of these multipliers across the tax schedule depends on the structure of the schedule (income brackets, changes in the marginal and average tax rates).

From Table 2 we can also see that the minimum required wage increase is 15.0% and the maximum 18.6%, while the expected rate of inflation is assumed to be 15.7%. This means that in order to have R.D.I unchanged, for the next year, wage earners must take different wage increases according to their income level and their marginal tax rate. This is exactly the crucial point here because it is impossible for employers to give different increases to their employees according to the height of their income.

### 3.4. A workable mechanism

We must mention that Tanzi has pointed out that the application of a mechanism of the coordination of tax and incomes policies is very difficult. This is so mainly because of the tax factor. He points out that the average and

TABLE 1

**Income tax schedule for 1988 and the proposed for 1989 (indexed with P\* = 15%)\***

Income Brackets £		Marginal Tax Rates % 1988 & 1989	Average Tax Rates % 1988 & 1989
1988	1989		
0 – 1,200	0 – 1,380	18	18,0
1,200 – 2,800	1,380 – 3,200	21	19,7
2,800 – 4,400	3,220 – 5,060	24	21,3
4,400 – 6,000	5,060 – 6,900	28	23,1
6,000 – 8,000	6,900 – 9,200	33	25,6
8,000 – 10,000	9,200 – 11,500	38	28,0
10,000 – 13,660	11,500 – 15,640	43	32,0
13,600 – 18,800	15,640 – 21,620	49	36,7
over – 18,800	21,620	50	

\* Income Allowances (for a married wage earner without children): £ 4400 (1988) where the tax credit is £ 936, and £ 5060 (1989) vis. £ 1076 tax credit.

marginal tax rates are not the same for all salary and wage earners, but vary according to their income which in turn, depends on seniority, type of work, industry and so on. Therefore, if the wage level should adjust for some "typical" group of workers, it would be too high for some and too low for others. In other words, if general wage negotiations bring about a uniform percentage increase for all wage levels that is adequate for the "average" wage, some groups of workers will find their disposable income dropping<sup>10</sup>.

The main problem, therefore, is how to reform the personal income tax system in order to have the same wage multipliers independently of the income level of wage earners.

We found that in the case where full indexation of the tax schedule and income allowances is applied, the wage multipliers are reduced. The striking,

10. Tanzi V. (1980), pp. 136–37.



TABLE 2

**Wage Multipliers and required wage increase in order to offset inflationary increases and for higher M.T.R. of the Tax Schedules 1988 & 1989**

A.T.R. % \ M.T.R. %	18.0	19.7	21.3	23.1	25.6	28.0	32.0	36.7	
18	1.0	15.0*							
21	1.04	1.02	15.3*						
24	1.08	1.06	1.04	15.6*					
28	1.14	1.12	1.09	1.07	16.1*				
33	1.22	1.20	1.17	1.15	1.11	16.7*			
38	1.32	1.30	1.27	1.24	1.20	1.16	17.4*		
43	1.44	1.41	1.38	1.35	1.30	1.26	1.19	17.9*	
49	1.61	1.57	1.54	1.51	1.46	1.41	1.33	1.24	18,6*

\* Percentage Increases of nominal wages in order to offset the expected rate of Inflation 15% (1989).

indeed, result is that this reduction is low for low incomes and high for high income brackets. This differential reduction leads to the formulation of exactly the same wage multiplier independently of the income level. Thus, after full indexation of the tax schedule and income allowances has been applied, all workers need the same proportion wage increase in order to maintain their real disposable income at least at the level of that of the previous year. There is, therefore, a trade - off between tax policy and incomes policy. So it is possible to adjust the tax system by a percentage which exceeds the rate of inflation and then the required wage increase will be less than the rate of inflation.

Our analysis is verified by the results appearing in Table 3. We see that as a result of the full indexation of the tax schedule and income allowances, without any wage increase, disposable income progressively increases. Thus, if a worker's declared income is £ 4000 (which coincides with gross income, since in Greece there are not income allowances but only tax credits) then, after indexation, this worker's disposable income doesn't change at all (due to the absence of negative

income taxation). This means that, in order to maintain his real disposable income (1988) unchanged his wages must increase (1989) by a percentage equal to the rate of inflation ( $P^* = 15\%$ ). A wage earner with £ 12,000 income will have a 3.9% increase in his disposable income as a result of full indexation. This percentage in fact offsets the effect of tax progressivity on wage increases. It is apparent from Table 3 that, after full indexation of the tax schedule and allowances (with and without change in marginal tax rates) the wage increase required, in order to maintain worker's R.D.I unchanged, is equal to the rate of inflation. Indeed, by increasing nominal wages by 15%, we observe that disposable income increases by 15% as well, which means that Real Disposable Income doesn't deteriorate.

In this way we may overcome the problem that arises when we have different wage increases for each income level. It is obvious, therefore, that the indexation of the personal income tax is necessary,

TABLE 3  
Indexation of the Income Tax Schedule and Tax Reductions (Allowances) and its Impact on Disposable Income (£)

Declared Income	Tax of Tax Schedule		Tax Credit		Final Tax Payment		Disposable Income (Yd)		Percentage change of Yd (%) 1989/1988
	1988 (2)	1989 (3)	1988 (4)	1989 (5)	1988 (6 = 2-4)	1989 (7 = 3-5)	1988 (8 = 1-6)	1989 (9 = 1-7)	
4,000 (4,600)	840	822 (966)	936	1,076 (-n-)	0	0 (0)	4,000	4,000 (4,600)	0.0 (15.0)
6,000 (6,900)	1,384	1,340 (1,592)	936	1,076 (-n-)	448	263 (515)	5,552	5,737 (6,385)	3.3 (15.0)
8,000 (9,200)	2,044	1,955 (2,351)	936	1,076 (-n-)	1,108	878 (1,274)	6,892	7,122 (7,926)	3.3 (15.0)
12,000 (13,800)	3,664	3,440 (4,214)	936	1,076 (-n-)	2,728	2,363 (3,137)	9,272	9,637 (10,663)	3.9 (15.0)
16,000 (18,400)	5,528	5,181 (6,357)	936	1,076 (-n-)	4,592	4,105 (5,281)	11,408	11,895 (13,119)	4.3 (15.0)

1. The declared Income in the parentheses (1989) is derived from that of 1988 indexed by 15%.
2. The Tax Schedule and Allowances have been adjusted on the assumption that  $P^* = 15\%$  (1989).
3. The "typical" taxpayer is assumed to be a Married Wage Earner without children.

even when gross income is adjusted for inflation. This is so because indexation takes into account the redistributive and efficiency effects of the adjustment of gross income.

It is, therefore, possible to coordinate tax and incomes policies in practice according to our analysis. Such coordination may have considerable economic policy implications:

- a) The policy maker can restrain the percentage change of nominal wages without affecting the wage earner's net income, by reducing the personal income tax liability. This restraint will result in a low increase of labour costs and, in turn, in a low increase of prices.
- b) An increase in net income can be achieved through a tax reduction instead of through an increase in nominal wage rates.
- c) The control over of labour costs will lead to increased production and lower unemployment.
- d) It will ensure elimination of the fiscal drag and function as an incentive to increase productivity.
- e) The reduction of income tax will result in a smaller public sector and a more efficient allocation of public expenditures.

The general conclusion, therefore, is that the coordination of tax and incomes policies will lead to higher employment without a rise in the rate of inflation.

#### 4. CONCLUSIONS

In summarising the results obtained from this work, we may argue that the estimates may be considered satisfactory from both a statistical and an economic point of view. The findings have substantial economic implications and can be very useful to economic policy makers.

More specifically, (a) we measured the impact of personal income tax on wages by using a single wage equation model for the Greek economy. According to the findings, this tax affects wage determination (tax-push inflation), which means that the P.I.T can be used as a complement to incomes policy in order to deal with inflationary pressures, (b) We calculated the wage multipliers from which we derived the wage increase required for maintaining real disposable income unchanged in 1989. (c) We measured the effect of income and/or tax policy upon the formation of real disposable income.

The main conclusion drawn from these findings is that incomes policy is effective with respect to low incomes, while tax policy is effective with respect to high incomes. For this reason, it is necessary to coordinate incomes and tax policy in order to control inflationary pressures, to encourage the productive work effort and to protect the real disposable income of wage earners. The coordination of tax and incomes policies may be made more effective through the introduction of compensation payments in the case of negative income tax (where, tax < tax credit), e.g., through the application of the "linear income tax system" instead of the "piece-wise tax system" which is usually used.

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