Universität Potsdam

Hans-Georg Petersen

Taxes, Transfers, Economic Efficiency and Social Justice

Essays on Public Economics 1979 – 2009

Chapter 2: Shadow Economy

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Contents

Chapter 1:
Redistribution – Theory and Measurement

Chapter 2:
Shadow Economy

Chapter 3:

Impact of Taxation and Tax Reform

Chapter 4:
Economics of Transformation

4.1.

Towards a Reformulation of the Role of the Tax and Social State in the Polish Transformation Process

Co-author Klaus Müller

(Marek Belka and Hans-Georg Petersen (Eds): Economic Transformation in Poland. Reforms of Institutional Settings and Macroeconomic Performance. Frankfurt, New York 1995, pp 131 – 141)

4.2.

Taxes and Transfers: Financing German Unification

Co-author Michael Hüther

(Ghanie Ghaussy and Wolf Schäfer (Eds): Economics of German Unification, London, New York 1993, pp 73 – 91)

4.3.

The Polish Success in Monetary Stabilization

Co-author Christoph Sowada

(Beihefte zu Kredit und Kapital, Heft 13, Konzepte und Erfahrungen der Geldpolitik, Berlin 1995, pp 383 – 411)

4.4.

On the Integration of Industrial and Social Policy in the Transition Process

Co-author Christoph Sowada

(Hans-Georg Petersen (Ed): Industrial and Social Policy in Transition Countries – Two Case Studies: Poland and Bulgaria. Shaker Verlag, Aachen 2000, pp 33 – 59)

4.5.

Privatisation and Ownership: The Impact on Firms in Transition – Survey Evidence from Bulgaria

Co-authors Atanas Christev and Felix FitzRoy

(Hans-Georg Petersen (Ed): Industrial and Social Policy in Transition Countries – Two Case Studies: Poland and Bulgaria. Shaker Verlag, Aachen 2000, pp 177 – 212)

Chapter 5:
Group- and Microsimulation

5.1.

Simulation Models in Tax and Transfer Policy: Introduction

Co-author Johann K. Brunner

(Johann K. Brunner and Hans-Georg Petersen (Eds): Simulation Models in Tax and Transfer Policy, Frankfurt, New York 1990, pp 11 – 18)

5.2.

Microsimulation of Alternative Tax and Transfer Systems for the Federal Republic of Germany

Co-authors Michael Hüther, Matthias Müller and Bernd Schäfer

(Johann K. Brunner and Hans-Georg Petersen (Eds): Simulation Models in Tax and Transfer Policy, Frankfurt, New York 1990, S. 539-572)

5.3.

Revenue and Distributional Effects of the Current Tax Reform Proposals in Germany – An Evaluation by Microsimulation

Co-author Christhart Bork

(Hans-Georg Petersen and Patrick Gallagher (Eds): Tax and Transfer Reform in Australia and Germany. Australia Center Potsdam, Berlin 2000, pp 219 – 235)

Chapter 6:
Social Policy, Higher Education and Environmental Economics

6.1.

World Crisis in Social Security: West Germany

Co-author Karl Heinz Jüttemeier

(Jean-Jacques Rosa (Ed): World Crisis in Social Security, Paris, San Francisco 1982, pp 181 – 205)

6.2.

Gloomy Prospects for Social Retirement Insurance - An International Phenomenon
Co-author Karl Heinz Jüttemeier
(Intereconomics, Hamburg, Vol. 18 (1983), pp 11 – 17)

6.3.

International Reforms of Health Care Systems: Quasi Markets, Privatization, and Managed Care. Comment on Richard M. Scheffler
(Herbert Giersch (Ed): Reforming the Welfare State, Berlin et al. 1997, pp 261 - 266)

6.4.

Systemic Change Instead of Curing Symptoms: Coordinating Social and Private Health Insurance in Germany and Beyond
(Case Doradcy Sp. z o.o., Forum Ochrony Zdrowia. Warsaw 2004, pp 1 – 26, in Polish Language)

6.5.

Education Return and Financing: Donated Affluence as Consequence of Tuition Free Study Programs in Germany
(Finanzwissenschaftliche Diskussionsbeiträge Nr. 55, Potsdam 2007)

6.6.

Economic Aspects of Agricultural Areas Management and Land/Water Ecotones Conservation
(Ecohydrology & Hydrobiology, Warsaw, Vol. 1 (2001), pp 46 – 58)

Preface

This volume contains the articles and papers which predominately have been published in international journals or edited volumes in the period from 1979 to 2009. The single articles reflect the main research areas of the editor and his co-authors who were engaged at the Kiel Institute of World Economics, the Johannes-Kepler-University Linz/Austria, the Justus-Liebig-University Giessen, the University of Potsdam, and the German Institute for Economic Research (DIW Berlin). The editor would like to thank all the copy right holders for their content; if any have been inadvertently overlooked the editor will be pleased to make the necessary arrangement at the first opportunity.

The editor would also like to thank Doris Gericke and Christina Bennewitz for all their effort they have invested in the creation of this volume. As a matter of course the editor is deeply indebted to all his co-authors and collaborators and last but not least to all the foundations, which have supported the research projects by generous grants.

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Hans-Georg Petersen

Chapter 2:

Shadow Economy

2.1.

Shadow Economy, Laffer Curve and Illicit Cash in Simple Macroeconomic Models

(10th Anniversary Edition of the Greek Journal of Political Economy, Athens 1990, pp 118 – 157, in Greek Language)

2.2.

Size of the Public Sector, Economic Growth and the Informal Economy - Development Trends in the Federal Republic of Germany

(The Review of Income and Wealth, New Haven/Conn., Series 28 (1982), pp 191 – 215)

2.3.

Taxes, Tax Systems and Economic Growth

(Herbert Giersch (Ed): Towards an Explanation of Economic Growth, Tübingen 1981, pp 313 – 347)

The LAFFER Curve and "Illicit Cash" in Simple Macroeconomic Models

by Hans-Georg Petersen

C o n t e n t s

I. INTRODUCTION TO THE PROBLEM

The discussion of a demand or supply-oriented real-world econo-
mic and fiscal policy is a major issue considering the high and
on-going unemployment in western countries. At first the "de-
mand-oriented" economic policy seemed to be a mere political
slogan[1], but there have been many publications recently which
have contributed to its theoretical foundation[2]. Nevertheless,
one can certainly not ignore the fact that these publications
are chiefly oriented towards microeconomics or else based upon
the restrictive assumptions of neoclassical theory[3]. An inte-
gration into macroeconomic models has been mostly left undone;
this could be one reason why the dissatisfaction with tradi-
tional macroeconomic models is growing.

The discussion of the LAFFER curve and the informal economy
haven't had much influence on the theory of macroeconomics
either, although they have made their way into some textbooks.
Both problems are closely connected to the consequences of go-
vernment activities, especially on supply of effort by indivi-
duals. If we concentrate on the effects of taxes, the LAFFER
curve can be ascribed to the response of tax avoidance, or, in
other words, to the dominance of the substitution effects; with
increasing tax rates the supply of effort in the formal sector
is reduced and shifts (totally or partially) into the informal
sector.

With an increasing tax burden, not only tax avoidance will be-
come more important, but also tax evasion (see ISACHSEN and
STRØM 1980, SANDMO 1980). This means that either parts of the

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1) See primarily WANNISKI (1978) but also ROBERTS (1984).

2) One should mention especially the publications of American
   authors; see for example CANTO, JOINES and LAFFER (1983),
   MEYER (1981), FINK (1982).

3) At least some supply-side oriented "classial" macroeconomic
   models have been formulated, e.g. SHALLER and YUNKER (1986).

market income, or the whole revenue from work on the side (il-
licit work), are not reported to fiscal administrations. In so
far as illicit work has been paid for with money, it will in-
fluence the economy's total demand for money. In the KEYNESIAN
liquidity preference theory we will then have, in addition to
the transactions and the speculations motive, the tax-evasion
motive (PHILIP 1949). In the following remarks the possible
effects of tax avoidance and tax evasion will be discussed.
Since a comprehensive analysis hasn't been achieved yet, the
aid of graphs from macroeconomic models will be necessary. In
chapter two we will integrate the LAFFER curve into a simple
macroeconomic model, pursuing a concept of general wealth which
is composed of real revenues aquired in the formal and informal
sector. The third chapter deals with the effects of tax evasion
on the demand for money, before we turn to an analysis of the
total effects in the simple IS/LM model in chapter four.
Chapter five tries a first approach at integrating the
hypotheses of both behaviors into the model of neoclassical
synthesis. And finally, the practical importance of these
theoretical approaches is examined in chapter six.

II. THE LAFFER CURVE IN A SIMPLE MACROECONOMIC MODEL

The LAFFER curve, in its simplest form establishes a quadratic
relationship between a tax base and tax revenue. It is assumed
that the tax base is reduced as tax rates increase; this
assumption is backed by observations of some single taxes and
tariffs. It is of course a simplification to apply these ob-
servations in regard to some single taxes to the relation of
macroeconomic tax rate and gross national product; GNP is in-
terpreted as a well-defined base for taxation on which only a
single proportional tax rate will be imposed (BUCHANAN and LEE
1984). With these assumptions we have eliminated the problems
of complex tax systems, such as the existence of many different
bases for taxation, progressive tax rates and so forth. Despite

these restrictions the LAFFER curve remains an important hypo-
thesis of behavior, although it shouldn't be applied directly
to problems of practical tax policy and fiscal policy.

1. Interpretation of the LAFFER curve

To simplify further analysis and to allow the reader more imme-
diate access to the calculations, we assume a linear relation-
ship between the potential tax rates[4] t and the GNP Y:

(1) $Y = \alpha - \beta \cdot t$.

Tax revenue T follows from the multiplication of equation (1)
with the tax rate t:

(2) $T = \alpha \cdot t - \beta \cdot t^2$.

Equation (2) represents the LAFFER curve (see Fig. 1). The max-
imum tax revenue is attained with the critical tax rate t_c.

In their approach, BUCHANAN and LEE (1984, p. 281) interpret
equation (1) as a demand curve: "We consider the behavior of
the potential tax payer as a potential 'demander' of the tax
base". In other words, the tax payer demands units of the na-
tional product, which is unterstood to be a uniform commodity
(see FULLERTON 1982). The taxpayer offers effort (labor, for
example) in order to demand the tax base (GNP) with the ob-
tained income. This implies the validity of SAY's law.

Now we want to drop the assumption that supply and demand are
identical. Following BEENSTOCK and GOSLING (1979), we will in-
terpret equation (1) as a supply function (see PETERSEN, 1981,
p. 314 and 318). The strictly negative correlation between al-
ternative levels of the tax rate and GNP is explained with the

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4) Since a proportional tax is assumed, the marginal and the
   average tax rate are identical.

Figure 1: Production Function and the LAFFER Curve
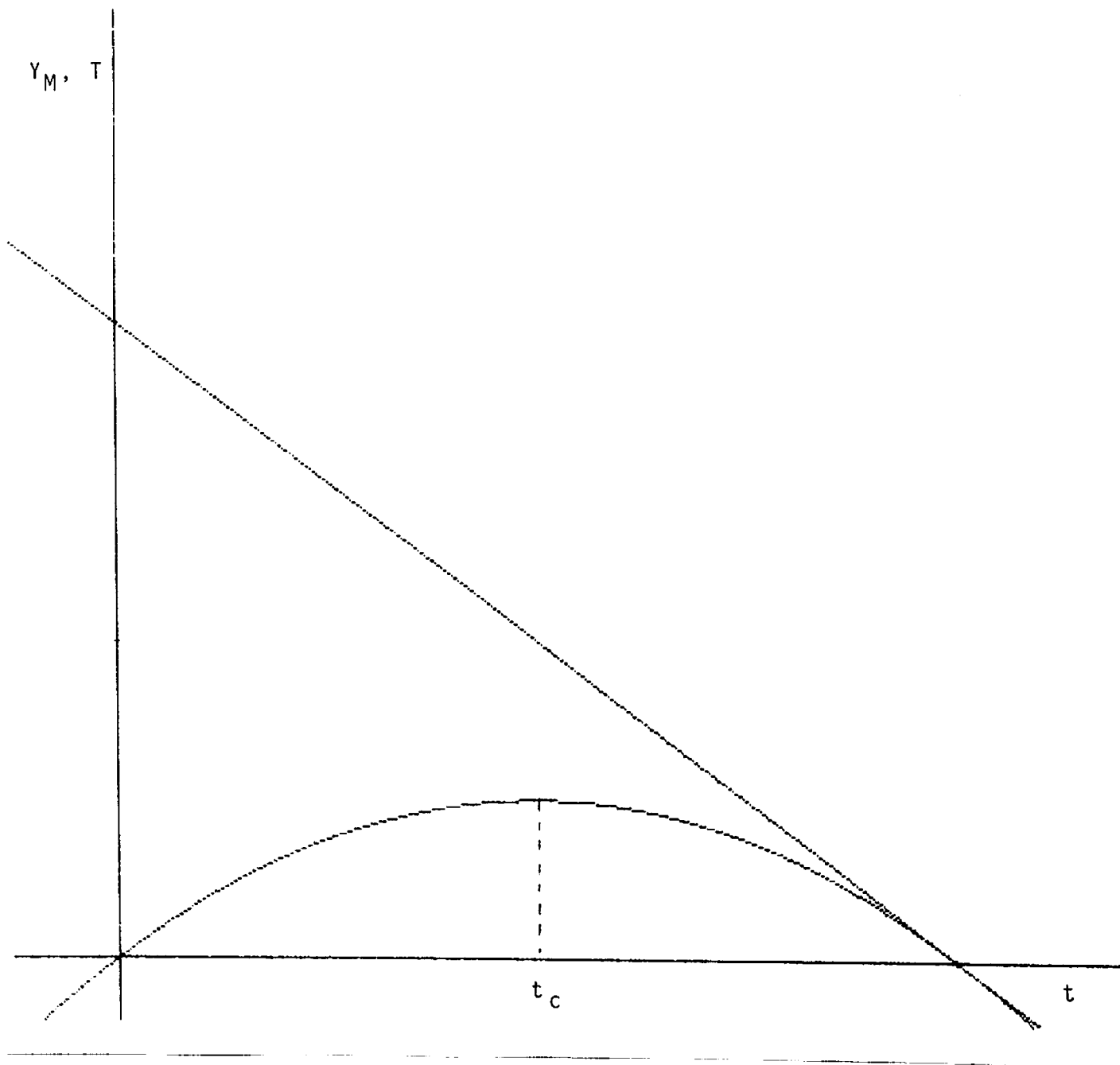
dominance of substitution effects, or with the tendency to avoid taxes, respectively.

In a short time analysis with a given supply of capital, GNP depends only on the input of labor. Increasing tax rates will now cause a reduction in labor supply which, in turn, will reduce GNP.

The concept of the GNP is, on the whole, a concept of market income, non-market incomes being mostly neglected.

But a reduction in labor supply in the formal sector doesn't necessarily involve an increase of leisure time for recreation, which is implicitly assumed in the neoclassical model of income and leisure. According to the theory of time allocation of BECKER, LEIBENSTEIN, and others, working hours set free in the formal market are used, at least partly, for productive acitivities in black markets[5] or in private households. In order to be able to evaluate the welfare effects of this tax avoidance in the formal sector, we have to work with a concept of total wealth which includes the possibilities of production outside the formal sector (see PETERSEN, 1984 a, pp. 114).

Hence the total wealth W of an economy consists of the real national product, Y_M, obtained in the formal sector, and of the real product Y_S, which is produced in the informal sector (shadow or underground economy):

$$(3) \quad W = Y_M + Y_S \ .$$

In this simple two-sector-model, government influences only the formal sector directly, exclusively via the tax rate t, fixed by government itself; equation (1) can be translated into

$$(4) \quad Y_M = \alpha - \beta \cdot t \ .$$

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5) Whether these activities are legal or illegal is not important here.

The working hours set free in the formal sector are completely used in the informal economy for the production of Y_S. It is assumed that individuals have a fixed time budget and that the planned working hours are divided between market and shadow activities, with the division depending only on the tax rate in the market sector. The possibility of substitution between these two sectors is perfect. The production, or the supply function for the informal sector reads as follows:

(5) $Y_S = \gamma \cdot t$.

This means that supply in the informal sector increases as the tax rate in the formal sector is raised. Moreover it is assumed that, in the informal economy, SAY's law holds true: supply equals demand. This assumption appears restrictive, but the relations between buyers and sellers tend to be much closer in the shadow economy than in the market economy; the direct production on order dominates[6].

In Fig. 2 these relations are illustrated and some further assumptions are made. The maximum GNP of the formal sector Y_M^{max} is obtained with a zero tax rate $(t = 0)$. Consequently, all working hours are used in the formal sector, the real production of the informal sector Y_S being zero and total wealth being Y_M^{max} $(W = Y_M^{max})$. If government fixes the tax rate above zero, the market product Y_M decreases while the shadow product Y_S increases. Total wealth remains unchanged only if Y_S increases in the same measure as Y_M decreases.

Such a situation exists when productivity is the same in both sectors:

β = γ .

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6) This assumption is not a necessary condition but it facilitates the further analysis and simplifies graphic depiction. The results would be modified only slightly by dropping this assumption.

Figure 2: Supply Curve for the Formal and the Informal Sector
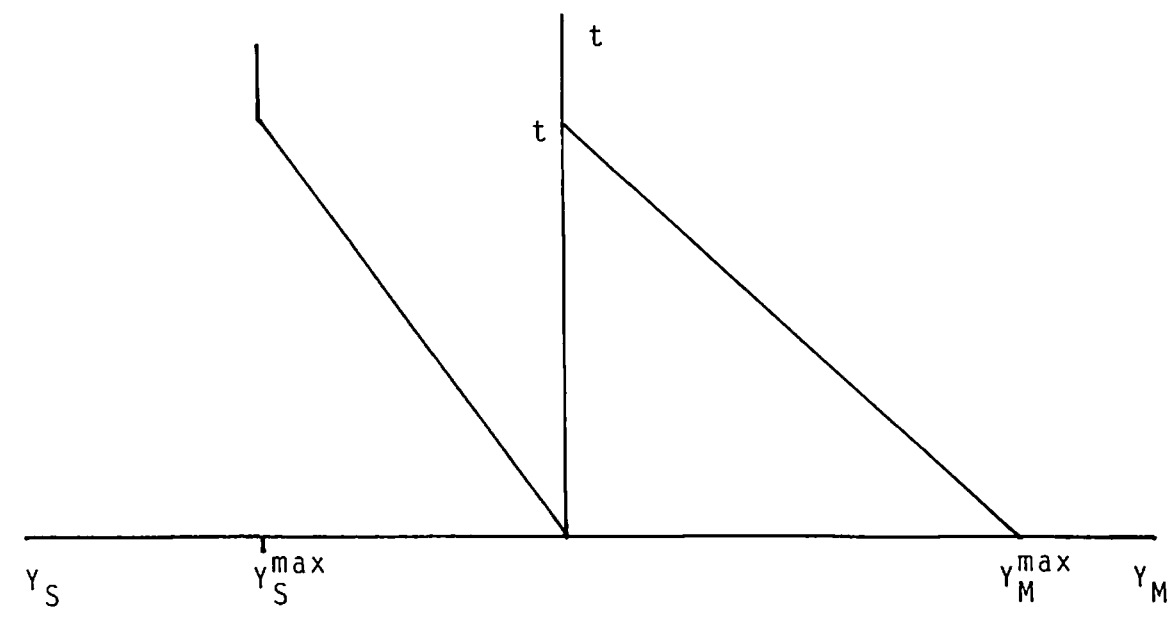
If a lower productivity in the informal sector is assumed,

$$\beta > \gamma \ ,$$

then total welfare W will be reduced as the tax rate increases[7]. A less elaborate division of labor and lower degrees of technology and organization favor the assumption that productivity is lower in the informal sector. In Fig. 2 a lower productivity of the informal sector is assumed. The maximum product in the informal sector is obtained when the tax rate is fixed so high that the market product collapses to zero. Above this tax rate, the supply function (and demand function) Y_S become totally inelastic with respect to the tax rate. Total welfare then is equal to Y_S^{max} ($W = Y_S^{max}$), with

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7) We want to stress that a fixed time budget is assumed, so that the total working hours employed in both sectors, remain unchanged. Incentives of taxation, which might reduce leisure in the narrower sense (idleness) will not be taken into account. In such a case the product Y_S might increase more, but total welfare would be reduced at the same time through a reduction of leisure in the narrower sense. The assumption of a fixed time budget renders the extremely difficult evaluation of leisure time unnecessary.

$$Y_B^{max} < Y_M^{max} \; .$$

Equation (4) represents the supply function of the formal sector. For the solution of the model we further need a demand function, which will be our concern in the next paragraph.

2. The Simple Total Model

The demand function of the simple KEYNESian model will be used to cover the demand-side of the formal sector. The aggregate demand Y_M^d consists of:

(6) $\quad Y_M^d = C \; (Y_M^n) + I + G$,

where C means private consumption, I private investments and G government expenditure for goods and services. Consumption depends on the disposable formal income Y_M^n; investments are first assumed autonomous. The absolute income hypothesis finds expression in the consumption function:

(7) $\quad C = c \; (1 - t) \; Y_M \quad$ with $\quad c < 1$ [8] ,

where c represents the marginal propensity to consume and $(1 - t) \cdot Y_M$ represents the disposable income Y_M^n. Thus, for each tax rate t fixed by government, there is a different linear consumption function.

In this model government seeks a balancing of the budget, which means that government first decides about the volume of expenditure G and then fixes a tax rate t that brings about the corresponding tax revenue T:

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8) Consumption depends exclusively on the market income Y_M. This hypothesis is a consequence of the above postulated validity of SAY's law in the informal sector and helps essentially to simplify the further analysis. In the real world, parts of the income can certainly be transfered from one sector to the other.

(8) $G = T = t \cdot Y_M$.

Given an aggregate supply Y^*, fixed via the tax rate t, private demand is crowded out by the amount of tax revenue T and associated government expenditure G (total crowding out; the "Classical case"). It is assumed that, first, private consumption is crowded out; this implies that the consumption ratio has to diminish continously as tax rate increases so that autonomous investment and, with that, savings can be maintained initially. This relationship is depicted graphically in Fig. 3.

The autonomous aggregate demand Y_M^d is determined by autonomous investment I and government expenditure G, which is fixed at a certain level of the tax rate. At a tax rate of zero, t = 0 government expenditure is also zero (8), so that the autonomous demand equals investment. As tax rate increases, autonomous demand goes up within the range of $0 < t < 0,5$ as a result of increasing government expenditure (according to tax revenue, see Fig. 1)[9], and the propensity to consume has to fall in order to maintain equilibrium in the commodity market $Y_M^* = Y_M^d$ (45° line). At $Y_{M(t=0,5)}^*$ consumption in the formal sector is zero[10]. If equilibrium is also to be maintained within the range of $0,5 < t < 1$, autonomous demand has to be reduced. Thus, in a first step, government will crowd out investment spending via taxes and government expenditure, before it is eventually forced to reduce expenditure as well, according to equation (2).

Associated with the crowding out of private demand, production and demand in the informal sector will expand (see quadrant III in Fig. 3).

From equation (4), the equilibrium condition for the commodity market $Y_M^* = Y_M^d$ and from equation (5), we can now deduce a

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9) In Fig. 1 a critical tax rate t_c of 50 % is assumed; with a tax rate of 100 % the formal income collapses to zero.

10) In other words, consumption has been crowded out of the formal sector into the informal sector.

Figure 3: The Total Model
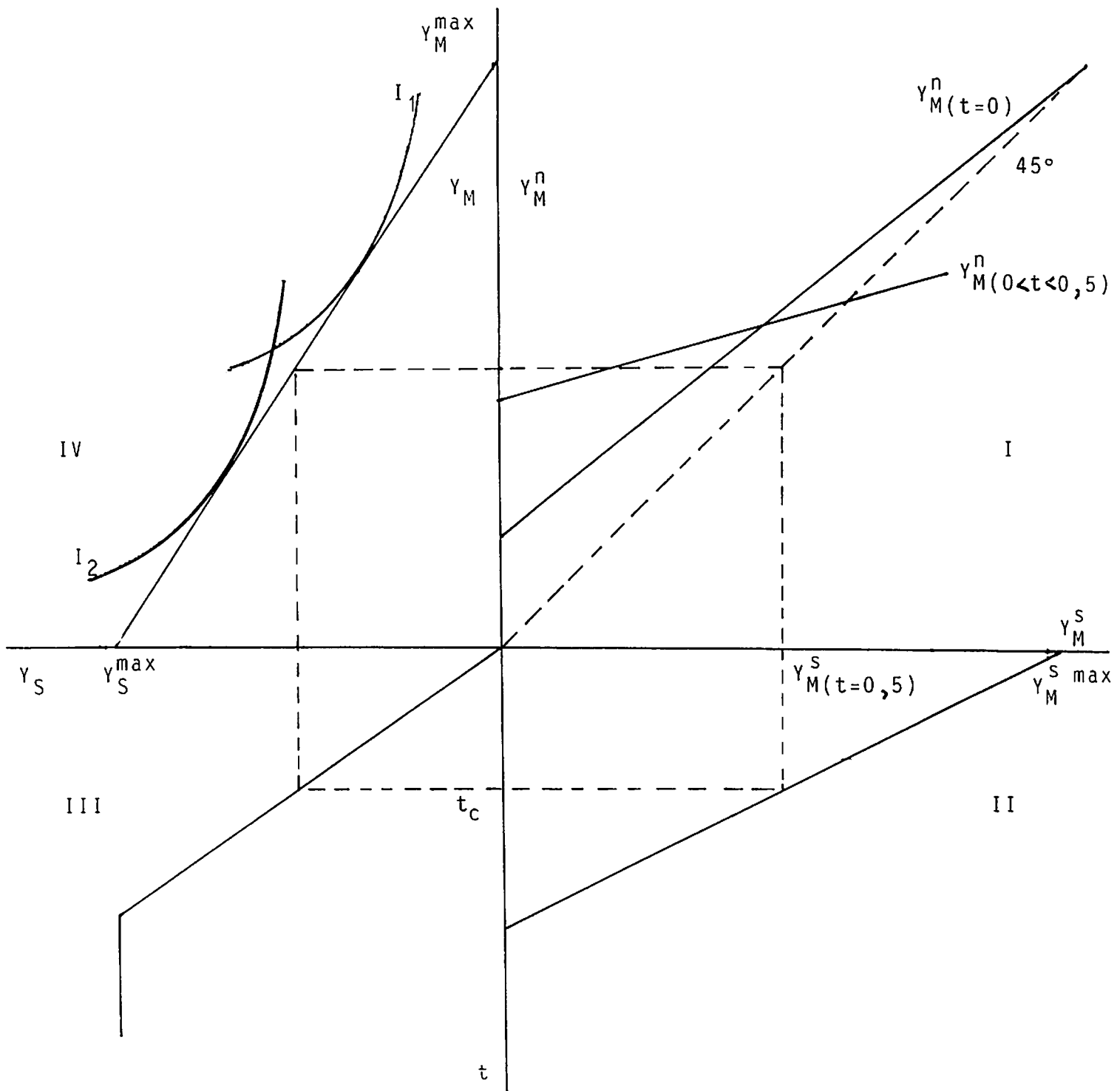
correlation between incomes in the formal and in the informal sector (Y_M and Y_B, respectively):

$$(9) \qquad Y_M = x - \frac{\beta}{\gamma} \cdot Y_B .$$

This function is the transformation curve between formal and informal income; it is depicted in quadrant IV of Fig. 3.

Now let us assume a social welfare function which embodies both the formal and the informal income (Y_M and Y_B) and let us derive the corresponding social indifference curve. The point, in which the utility maximizing social indifference curve is tangent to the transformation curve (which can also be thought of as a macroeconomic budget constraint) gives the optimal distribution of total welfare between the formal and the informal income, with the values being those of an equilibrium under the afore-made assumptions. In the formal sector a specific structure of aggregate demand (C, I and G) will occur, along with a specific tax revenue and the "optimal" tax rate t.

If the macroeconomic structure of preferences is pronounced in favor of the formal income we have, for example, a social indifference curve I_1; we are above $Y_{M(t=0,5)}^*$, in the income elastic range of the aggregate supply function. By making a distinction between a short-run and a long-run LAFFER curve, BUCHANAN and LEE (1984) have shown that even for a revenue-maximizing government it can be sensible to exceed the revenue-maximizing tax rate (here t = 0,5)[11]. In the short run[12] tax

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11) Without this theoretical approach for explanation it would be doubtful whether a revenue-maximizing government would exceed this critical tax rate t_c, because it wouldn't be very sensible "to kill the goose (i.e. the tax payer) that lays the golden egg".

12) According to STUART (1981), short run covers a period in between 5 and 10 years.

revenue can increase even with a tax rate above the critical one, whereas in the long run it will decrease[13].

Suppose that social appreciation of the informal sector is very pronounced (stress on non-material values, dominance of the productive and reproductive aspects within the family etc., see PETERSEN, 1984 a, pp. 121). If we assume the indifference curve I_2, for example, this implies that a tax rate exceeding the critical tax rate t_c might not only be reasonable from the standpoint of a revenue-maximizing government which operates with short time horizons, but it might even for the whole society be optimal from the standpoint of our model. Whether such a situation will be stable in the long run, is another question. Under our restrictive assumptions, the total dis-posable income Y_M^n would be used for savings and investment, whereby government would gain most by this investment. The crucial thing here would be the real income effects and the subjective appreciation of government expenditure; both cannot be taken into account within the limits of this simple model.

3. Non-Linear Production Functions, Investment that Depends on the Rate of Interest and the Problem of Equilibrium

The production function specified with equation (4) may seem too restricted because, in the beginning, there is likely to be an increase in market income, due to respent tax money by go-vernment[14]. Taxation has at least two effects on economic growth: on the one hand, it reduces available individual in-come, on the other hand, it influences growth via tax-financed public expenditures. When the public sector supplies more goods

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13) For a government which operates with short-time horizons in order to insure its reelection, for example, it might be absolutely reasonable to increase tax revenue in the short run to the detriment of the long-run revenue which will diminish.

14) According to Adam SMITH, public investment for infrastruc-tures is often necessary before private production can be taken up which will create formal imcome.

the share of goods and services with a low degree of publicness grows larger: state activities extend to merit and private goods. Declining efficiency of tax-financed public expenditures and partial excess supply in public goods and services connected with growing disincentives of taxation permit the supposition that there is a relationship similar to a production function.

Therefore, such a production function has not only a downward sloping branch, but also an upward sloping branch to start with. In quadrant II of our total model we therefore have, instead of a linear, negatively sloped production function, a polynom of a higher degree (see Fig. 4 in which a polynom of the 2nd degree is assumed). The production and the demand function in the informal sector[15] are specified accordingly. As tax rate increases, production is first shifted from the informal sector into the formal sector. At the critical tax rate t_c, formal production attains its maximum, while production and demand in the informal sector collapse to zero. Above the critical tax rate, formal production decreases while informal production increases. The resulting transformation curve in quadrant IV is again linear[16].

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15) The accompanying functions for the example shown in Fig. 4 are:

$$Y_M = 800\ t - 800\ t^2$$

and

$$Y_S = 150 - 600\ t + 600\ t^2 .$$

16) Solving the quadratic equation $Y_S = 150 - 600\ t + 600\ t^2$ for t yields two possible values for t:

$$t = {+\atop-} \sqrt{\frac{Y_S}{600}} + 0,5 .$$

The equation for the transformation curve then is:

$$Y_M = 800 \cdot (\begin{smallmatrix}+\\-\end{smallmatrix} \sqrt{\frac{Y_S}{600}} + 0,5) - 800 \cdot (\begin{smallmatrix}+\\-\end{smallmatrix}\sqrt{\frac{Y_S}{600}} + 0,5)^2 .$$

From this follows:

$$Y_M = -\frac{4}{3}\ Y_S + 200 ,$$

hence the equation is linear.

Figure 4:   The Total Model with
a Non-linear Production Function
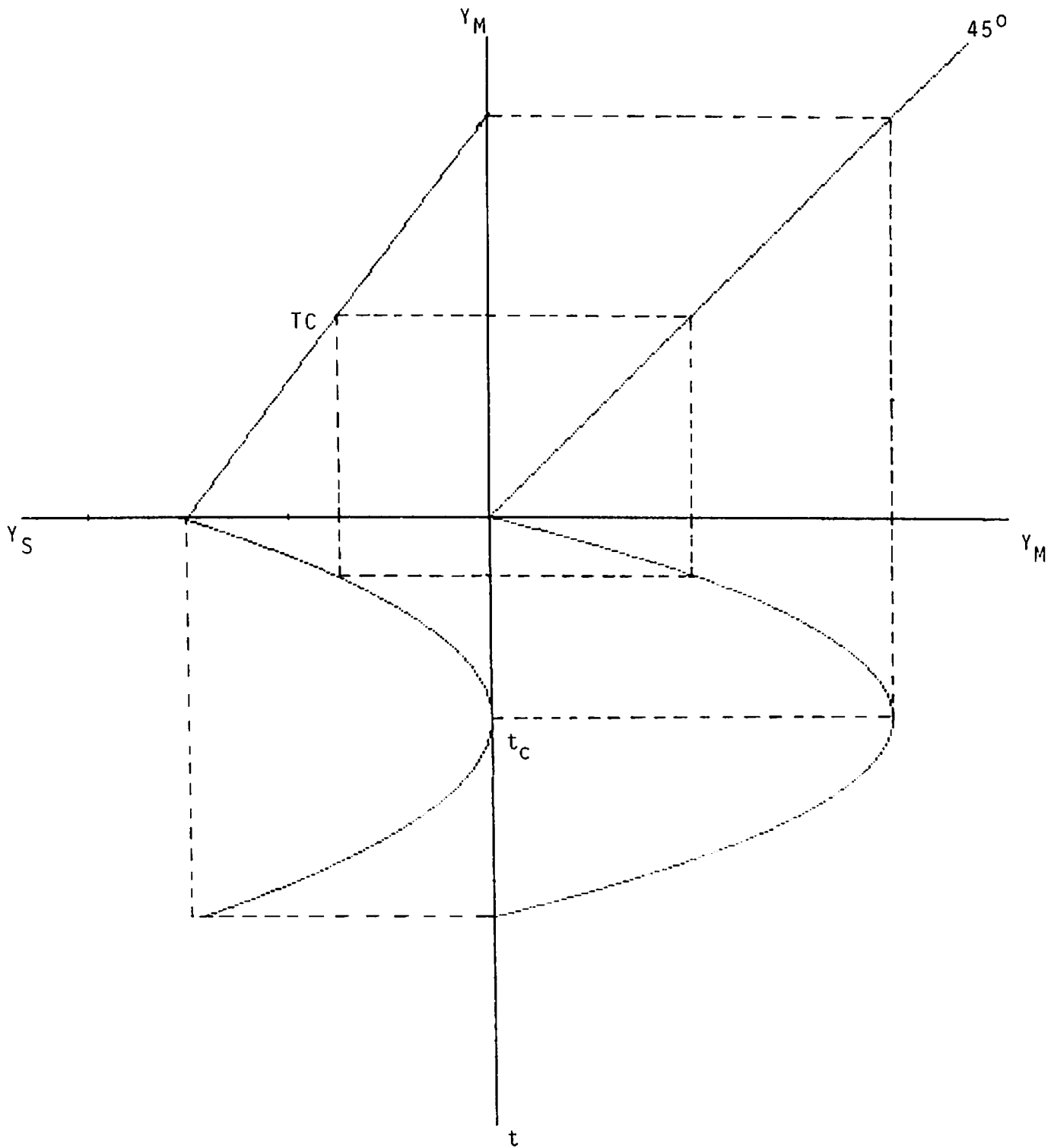
Fig. 5 depicts the non-linear production function and the ac-
companying LAFFER curve which is now a polynom of the 3rd de-
gree[17]. It has characteristics similar to those in the linear

<u>Figure 5:</u>   Production Function and LAFFER Curve within the
                 Non-linear Model
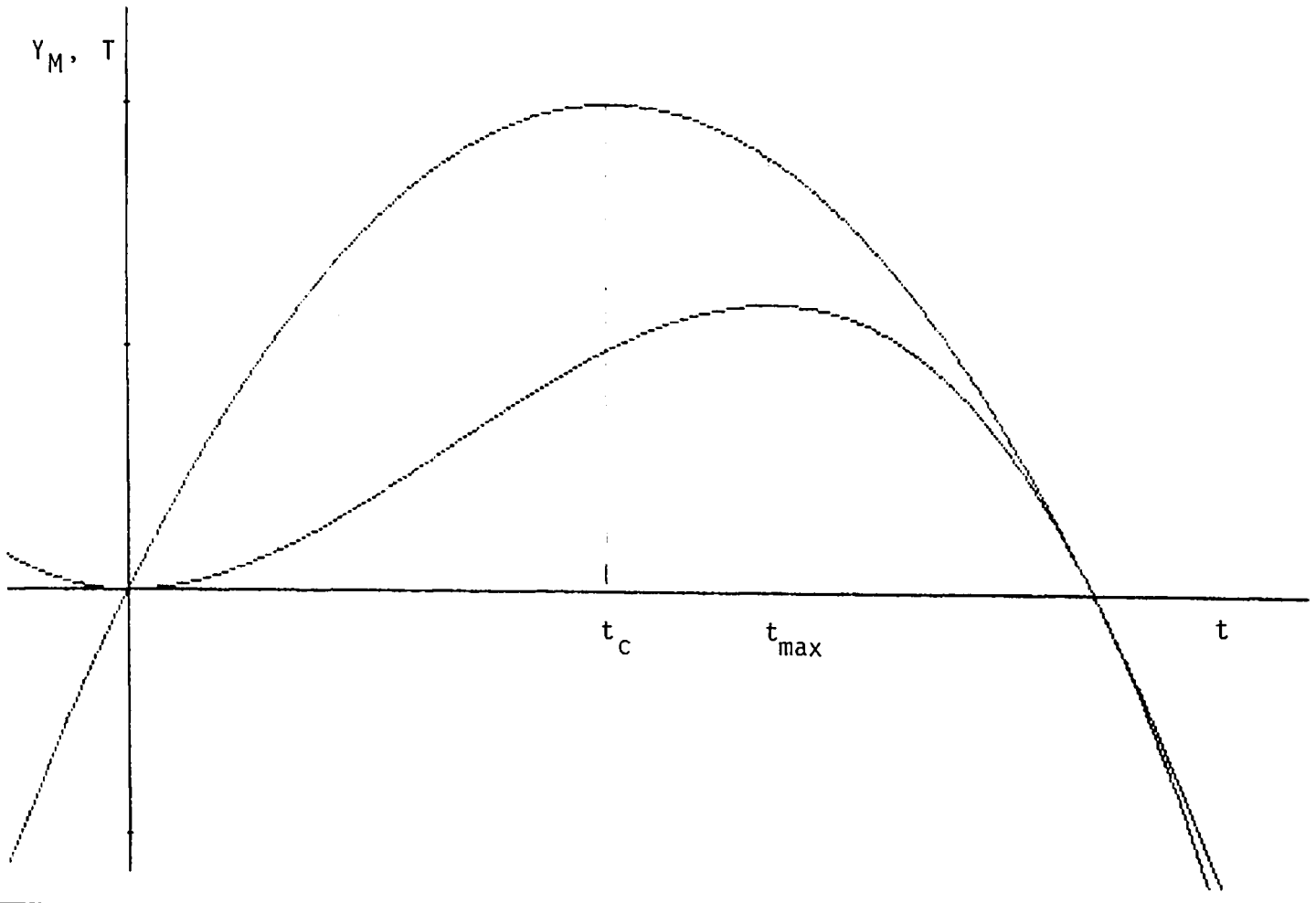
model, apart from the turning-point below the critical tax rate
t_c which maximizes production and income in the formal sector.
Note that the maximum tax revenue is only obtained above the
critical tax rate. For a revenue-maximizing government it would
thus be reasonable to fix the tax rate at t_{max}, that is, on the
downward sloping branch of the production function of the
formal sector. Within the scope of t_c to t_{max}, tax rate

17) In our example, the function of the LAFFER curve is:

$$T = 800 \ t^2 - 800 \ t^3 \ .$$

reductions would decrease tax revenue, increasing the formal income at the same time. Only above t_{max} do tax revenue as well as formal income decrease as tax rates are further increased.

The crucial thing to concentrate on for an optimal tax rate is the tangential point of the macroeconomic indifference curve and the transformation curve. But if an optimal tax rate above t_{max} is to be realized in our model, a special preference for the informal sector is required.

If we include investment, which depends on the rate of interest in our previous model, aggregate demand can also vary only within the demand of the formal sector determined via the tax rate. Exogenous variations in tax rate modify investment spending. If equilibrium in the formal commodity market is to be maintained, these modifications have to be set off by corresponding adjustments in the consumption function, because government determines its demand according to tax revenue.

So, if the tax rate falls, the marginal propensity to consume has to fall also; in other words, the marginal propensity to save must rise. In this model the total burden of adjustment is borne by consumption up to the critical tax rate, and additionally by investment above the critical tax rate.

If possibilities for perfect substitution with regard to consumption exist between the formal and the informal sector, equilibrium of the formal sector can only be maintained, if perfect information and an infinite velocity of adjustment also exist. If these two assumptions are not satisfied, changes in tax rate or in the rate of interest will cause, at least, temporary situations of disequilibrium. Excess demand and excess supply in the formal sector will result if necessary adjustments are not made for this circumstance. Hence, the existence of an informal sector increases the instability of the formal sector, or, in other words: If preferences in regard

to the shadow economy change, instabilities in the formal
economy will increase with the consequence of temporary
situations of disequilibrium[18]).

III. "ILLICIT CASH" AND THE DEMAND FOR MONEY

Besides the transactions motive[19] and the speculative motive
from the simple KEYNESian liquidity preference theory, we now
have to add another motive for the demand of money: the tax-
evasion motive.

1. "Illicit Cash" as a Motive for the Demand for Money

Approaches which explain the demand for money have already
played a special role in the discussion of how to measure the
shadow economy (see LANGFELD, 1984, pp. 196). Here we are con-
cerned with the question as to how far tax avoidance and tax
evasion influence the demand for money. In our simple macro-
economic model, tax avoidance is considered as being a
restriction for the supply of effort in the formal sector; the
supply of effort is extended in the informal sector at the same
time. Part of the production of the shadow economy is
undertaken in black markets (see PETERSEN, 1984, pp. 115); in
this case tax avoidance is connected to tax evasion. In order
to conceal these parts of the income from the fiscal
administrations, "illicit cash" is formed. Depending on how

---

18) If we assume, according to "new macroeconomics", temporary
    sticky prices and primary adjustments via quantities, tem-
    porary disequilibriums are more likely to occur than the
    WALRASian equilibrium solution. On disequilibrium theory
    and on the shadow economy, see SCHÄFER (1984).

19) For simplicity, the precautionary motive has been embraced
    in the transactions motive.

pronounced banker's discretion is, this "illicit cash" is held either as bank deposits and cash, or exclusively as cash.

The reduction of the formal income, as a result of tax avoidance, involves a reduction of transaction cash in the formal sector, whereas the demand for transaction cash increases in the informal sector. If Y_S^{max} was smaller than Y_M^{max}, as we assumed in our simple model, the demand for money for transaction purposes would decrease, given identical durations of holding cash balances in both sectors.

With increasing possibilities for fiscal administrations to control bank deposits, it is less likely that current spending habits will be alike in the formal and in the informal sector. If the use of current money dominates in the informal sector, the hoarding of cash will be increased, which implies a lower velocity of circulation along with a higher Cambridge k (duration of holding cash balances). It is possible that in this case the total demand for transaction cash remains constant or even increase[20].

But we also talk about tax evasion when parts of the formal income are not reported to fiscal administrations. There are two alternative possibilities to adjust one's behavior in response to an increase in the tax rate. Taxes can either be avoided by reducing labor supply in the formal sector, or they can be evaded by under-reporting. If under-reporting is chosen, the supply of labor in the formal sector remains unchanged. But it must be taken into account that cash may be hoarded[21] which can hardly be checked by fiscal administrations.

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20) By the way, hoarding cash in the informal sector can be associated with a drain of central bank money out of commercial banks. In other words, the reserve of precautionary balances should be increased in the banking sector as a result of changed spending habits. Consequently, the scope for the creation of credits, and with this, the multiplier for the creation of money would be reduced, and therefore the supply of money would decrease. Despite its importance for real-world economics, this effect will be omitted.

21) Of course, a drain of money onto illicit foreign deposits is also possible, but will be omitted from our model of a closed economy.

2. Tax Rates and the Demand for Money

Summarizing our previous remarks we can say that the two possible responses to an increase in the tax rate are tax avoidance and tax evasion. Unter the afore-made assumptions, the demand for "illicit cash" is positively correlated with the tax rate. The aggregate demand for money then reads:

$$(10) \qquad L_D = L_D \ (Y_M, \ t, \ i) \ ,$$
$$\qquad\qquad\qquad + \quad + \quad -$$

where the inferior signs describe the direction of correlation. This is depicted in Fig. 6, where L_{tc} represents transactions demand for money cash, L_{ic} demand for illicit cash, and L_{sc} speculative demand for money. The aggregate demand for money shows two inelastic and one elastic component with respect to the rate of interest (see PHILIP, 1949, pp. 215). If the tax rate increases, so will the demand for money, owing to the tax-evasion motive, and the function of the aggregate demand for money will shift to the right. Given an exogenous demand for money $\overline{M}$, the interest rate would consequently increase above i_1.

Figure 6: Total Money Demand
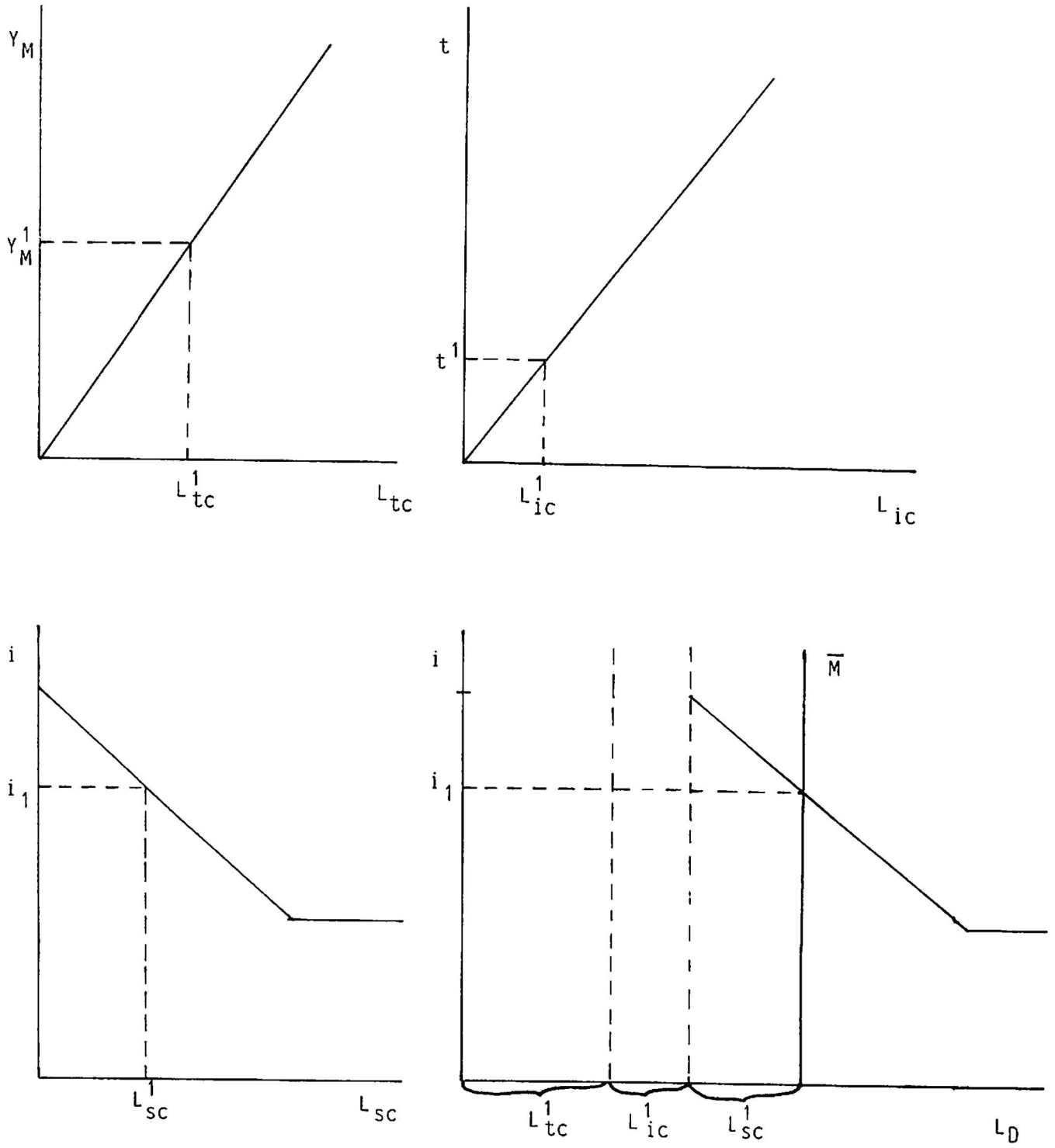
IV. THE LAFFER CURVE AND "ILLICIT CASH" IN THE SIMPLE IS/LM MODEL

Our starting point shall be a rudimentary IS/LM model as depicted in every introducing macroeconomic textbook. We shall first assume that aggregate supply is totally elastic, which means that it can expand along the 45° line; hence the IS curve is elastic with respect to the interest rate. In a next step we shall analyze the effects of tax evasion with a completely inelastic IS-function and the combination of tax avoidance and tax evasion in the IS/LM graph.

1. Tax Evasion with an Elastic IS-Function

According to the usual KEYNESian model we assume that the IS-function is elastic with respect to the rate of interest. Thus, there is no investment trap and total production can be extended since we assume that the factors of production are under-employed. If government increases its expenditures which are financed through an increase in taxes (budget blancing), the IS-function will shift to the right (from IS_0 to IS_1 in Fig. 7) on account of the increased multiplier effect of the additional expenditures (HAAVELMO-case). The equilibrium income Y_M^0 will increase to Y_M^1 as well as the equilibrium rate of interest (from i_0 to i_1). The feedback effects via the money market will entail a partial crowding-out of private demand for investment.

With the existence of "illicit cash", which depends on the tax rate, the total demand for money will increase as a result of increasing tax evasion, due to raised tax rates. The LM-function will shift upwards, parallel to itself. The new equilibrium income will be lower than Y_M^1 whereas the new equilibrium rate of interest will be higher than i_1.

Figure 7:   Tax Evasion with the KEYNESian IS-Function
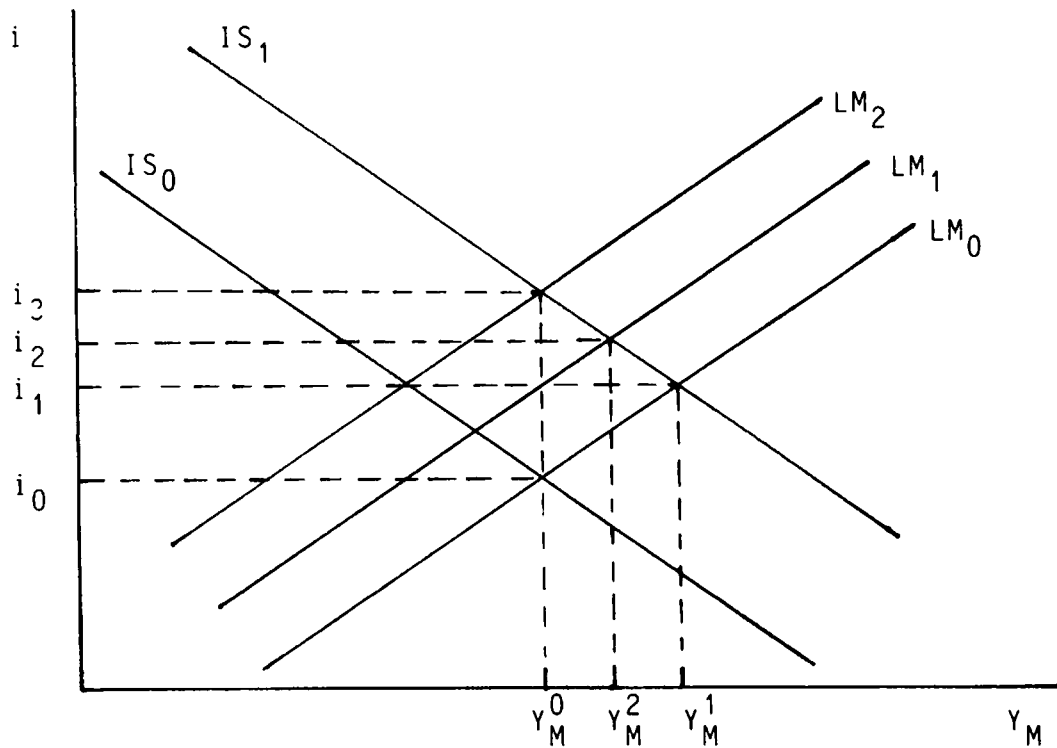
Whether the positive HAAVELMO-multiplier will be reduced, compensated or even outweighed depends ultimately on the slope of the curve for the demand for "illicit cash". In the case of government expenditures for goods and services, the HAAVELMO-multiplier will be clearly smaller than one; it can also be zero or negative.

2. Tax Evasion with a Completely Inelastic IS-Function

We shall assume that individuals respond to increased tax rates by evading taxes instead of avoiding them[22]. The IS-function, in our simple, linear model, is then completely inelastic and coincides with Y_M^{max} (see Fig. 8). As a result of increased tax

Figure 8: Tax Evasion with a Completely Inelastic IS-Function

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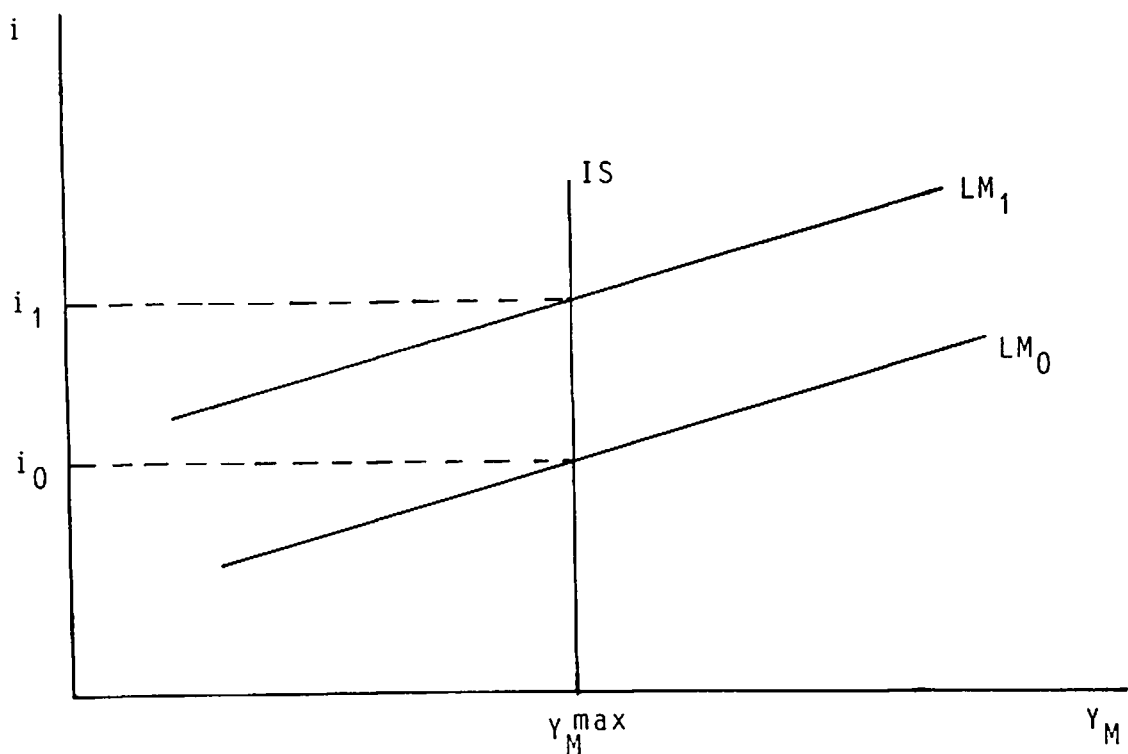
22) Discretionary modifications in the tax rate are not a necessary condition for tax evasion to increase rapidly. Probably, a certain threshold value has to be reached first, before persistent changes in behavior occur. Such a threshold value can be exceeded by so-called "secret" tax increases (an account of "cold" progression, for example, see PETERSEN 1977). Moreover, there may be a slowly growing resistance to taxation, based on the subjective impression that the existing tax system is "unfair". In other words, tax morality and tax discipline change for the worse, which is equivalent to an increasing tax evasion. See hereto the fundamental works by SCHMöLDERS and STRÜMPEL (1968). Corresponding threshold values might, of course, also exist for tax avoidance. For empirical studies on tax avoidance, see KOCH (1984).

rates, the demand for "illicit cash", as well as total demand for money, will go up, and the LM-function will shift upwards (for example, from LM_o to LM_1 in Fig. 8).

The additional government demand, resulting from the increase in tax rate, crowds out private demand for consumption, given a constant aggregate supply. The shift of the LM curve from LM_o to LM_1 entails an increase in the interest rate. If investment depends on the rate of interest, it will be reduced, so that an extension of private consumption becomes again necessary in order to maintain equilibrium on the commodity and money market. If these adjustments in demand are not made, the economic system will be threatened by disequilibrium situations.

3. Tax Evasion and Tax Avoidance

If both tax evasive and tax avoiding responses occur, the IS curves as well as the LM curves will shift. Given a linear production function and a maximum market income Y_M^{max}, the completely inelastic IS-function can only shift towards the tax axis, if the tax rate is increased and labor supply in the formal sector is reduced consequently. At the same time the LM curve shifts upwards as a result of the increased tax rate.

In Fig. 9 we can see how the IS curve shifts from IS_o (at Y_M^{max}) to IS_1 and the LM-curve from LM_o to LM_1, owing to the establishment of taxes. The formal income decreases to Y_M^1, without the effect of tax evasion, the tax rate would fall from i_o to i_1, whereas with the effect of tax evasion, the equilibrium interest rate will be above i_1, depending on the slope of the demand curve for "illicit cash". If the rate of interest doesn't remain constant, i.e. if it is lower or higher than the initial equilibrium rate, the structure of private demand will change, either in favor or to the detriment of the

Figure 9: Tax Evasion and Avoidance within IS/LM-Graph
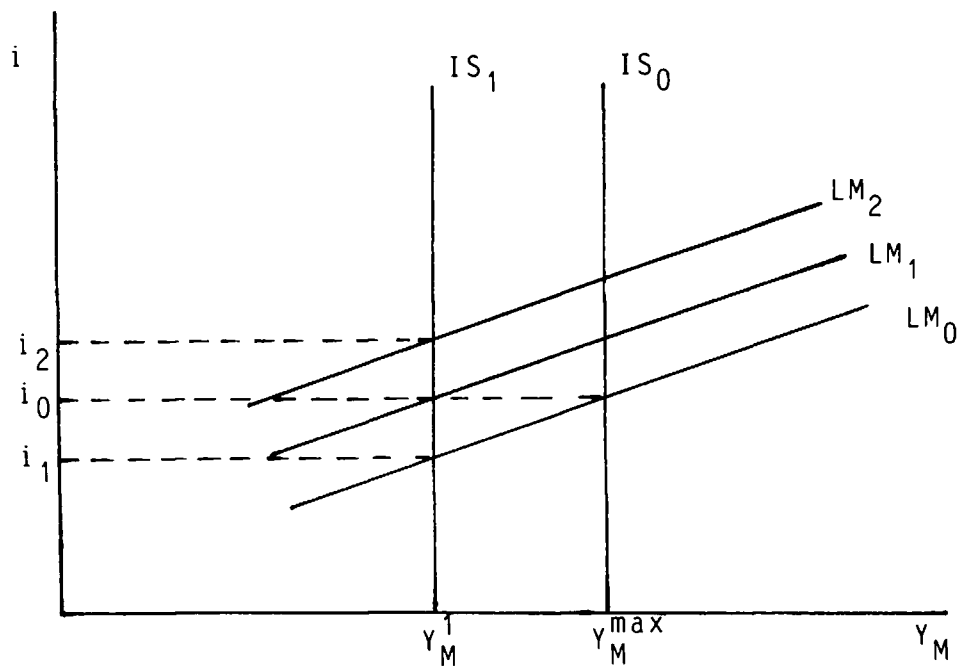
demand for investment. Incomplete adjustment will again bring about the risk of disequilibrium in the formal sector.

Now let us assume a non-linear instead of a linear production function for the formal sector (see Fig. 5). Responses of tax avoidance are then dominant only above the critical tax rate t_c. The formal income expands until the critical tax rate t_c is reached, which means that the IS curve (in Fig. 9) can shift from $Y_M = 0$ to Y_M^{max} as the tax rate rises. The LM-curve will then shift from LM_0 to LM_1 as a result of the tax evasion. The rate of interest will increase clearly because the new equilibrium rate of interest has to be above i_1. Since an increase in aggregate supply is completely absorbed by government, investment will decrease and a corresponding extension of consumer demand will become necessary in order to maintain general equilibrium.

I notice that, in the linear as well as in the non-linear model, the total working hours available for production are fixed and used in both the formal and the informal sector, depending on the tax rate level. If we assume flexible working hours,

which can be extended at the expense of leisure, the handicaps of productivity in the shadow production could be compensated or even outweighed by expanding working hours in the informal sector. In such a case, the demand for money for tax evasive purposes would become even more important. Thus it would be possible that the IS curve remains constant while the LM curve shifts to the left. The result would be a decreased formal income with an increased tax rate.

V. OUTLOOK: TAX EVASION AND TAX AVOIDANCE IN THE MODEL OF NEOCLASSIC SYNTHESIS

I want to discuss briefly the outlook on how tax evasion and tax avoidance can be dealt with in the complete KEYNESian Model[23]. Tax avoidance influences the commodity demand curve via the labor market, while tax evasion influences it via the LM curve. First, we will analyse the effects of tax avoidance on the labor market. In a next step we will illustrate graphically the effects of tax evasion and tax avoidance in the complete model.

1. The Labor Market and Tax Avoidance

The model of neoclassical synthesis embraces the supply-side of classical-neoclassical theory (labor market and production function) as well as the IS/LM-model respresenting the demand-side. It is now assumed that an income tax is either established (in the form of a wage tax) or increased. Such a taxation can influence the labor supply curve in two different ways, which is illustrated in Fig. 10.

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23) For a fundamental description of this model, see primarily FELDERER and HOMBURG.

Figure 10:   Effects of Taxation and Labor Supply
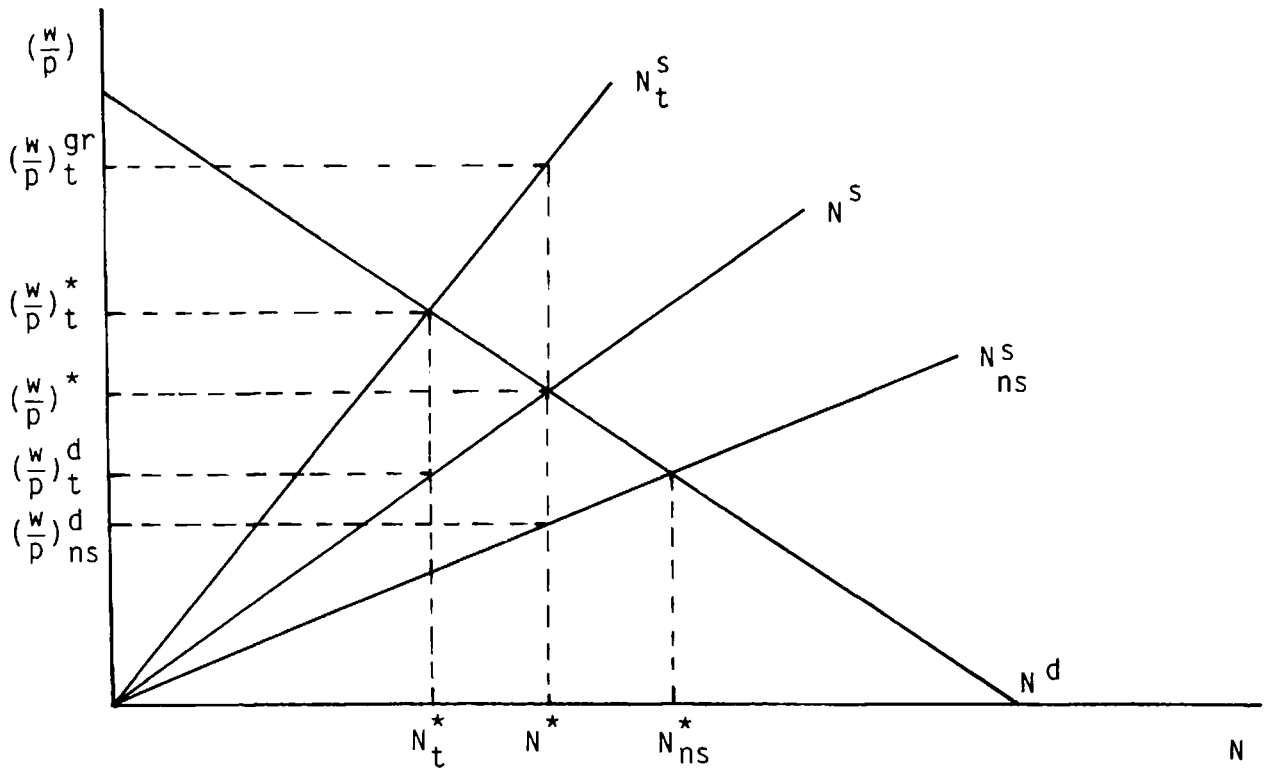
Fig. 10 depicts the labor market, where N^d represents the demand for labor and N^s the supply of labor. An equilibrium in the labor market occurs at a level N^* of employed labor and the real wage rate $(W/P)^*$. If wage earners don't respond to the tax impulse, the nominal wage rate will be reduced at any tax rate by the amount of the imposed tax (which increases along with the wage rate), given a proportional scale of income tax. Say wage earners accept the nominal wage rate $(W/P)_{ns}$, the labor supply curve would be swiveled to the right, and we would obtain the supply curve $N_{ns}{}^s$ (if tax is not shifted)[24]. Consequently, the employment of labor would increase to $N_{ns}{}^*$. In

24) with
$$(-)_{ns}{}^d = (-)^* \cdot (1 - t) \; . $$
$$\quad P \qquad\quad P$$

The extent of the clockwise rotation of the labor supply curve depends on the planned tax recovery.

other words, wage earners would respond to the establishment or increase of a tax by recovering the tax partially.

This response of wage earners is reasonable only if, besides the formal labor market, there is no inofficial labor market without taxation of labor, because in this case labor supply could be extended in the informal market without the additional labor income being restricted by a wage tax. In other words, the modification of relative (nominal) wages is favorable for the informal labor market.

Moreover, it wouldn't make sense that wage earners should resist the attempt of passing the tax on. It is more likely that wage earners would show a behavior similar to firms under perfect competition, and therefore try to shift the wage tax. They strive for a wage rate which is so much above the initial equilibrium wage rate that their initial nominal wage would just be maintained[25]. The supply curve will then swivel up to N_t^*.

A new equilibrium accurs at the level N_t^* of employed labor and the wage rate $(W/P)_t^*$. The new nominal wage rate will be $(W/P)_t^d$. Tax revenue can be calculated with the following equation:

(11)
$$T = \left((\tfrac{W}{P})_t^* - (\tfrac{W}{P})_t^d \right) \cdot N_t^* .$$

Part of this tax revenue will be shifted, or rather, passed back onto the demand for labor.

(12)
$$T_* = \left((\tfrac{W}{P})_t^* - (\tfrac{W}{P})^* \right) \cdot N_t^* .$$

Another part will be borne by wage earners

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25) The wage rate, strived for, is determined as follows:

$$(\tfrac{W}{P})_t^{or} = (\tfrac{W}{P})^* \cdot \frac{1}{(1 - t)} .$$

(13)
$$T_{n\text{-}} = (\ (\tfrac{W}{P})^* - (\tfrac{W}{P})_t^d\ ) \cdot N_t^* \ ,$$

with the amount of taxes shifted depending on the elasticities of supply and demand (see, for ex., KOLMS, 1974, p. 137).

Fig. 10 also tells us that the employment of labor has been reduced as a result of the attempted shifting ($N_t^* < N^*$). This reduction in employed labor can also be thought of as tax avoidance. The tax amount T_-, which is avoided by reducing the employment of labor, follows from:

(14)
$$T_- = (\ (\tfrac{W}{P})_t^{gr} - (\tfrac{W}{P})_t^*\ ) \cdot N^* - (\ (\tfrac{W}{P})_t^* - (\tfrac{W}{P})_t^d\ ) \cdot N_t^* \ .$$

Given an unchanged macroeconomic production function, the reduced employment of labor will result in a reduced aggregate supply.

2. Tax Evasion and Tax Avoidance in the Total Model

The demand-side of the model of neoclassical synthesis is represented by the IS/LM model. In chapter IV.1 we pointed out that an additional demand for money for tax evasive purposes shifts the LM curve upwards. Given an elastic IS curve, as is generally assumed in this model unless we have the special case ("deficit") of an investment trap, such an additional demand for money has consequences for the position of the commodity demand curve. Say, for example, a tax is established or a tax rate increased. If a respending of these means by government is, for the moment, left aside, the LM curve will shift upwards as a result of additional demand for money for tax evasive purposes; given a constant formal income Y_M and price level P, the commodity demand curve will shift downwards, parallel to itself. Furthermore, the IS curve will shift to the right, which entails a further downward-shift of the Y^d curve. This

relation is illustrated in Fig. 11, with Y^d describing the demand for commodities before tax (before an increase in the tax rate) and Y_t^d describing the demand for commodities after tax.

Figure 11: Effects of Tax Evasion on the Commodity Demand Curve
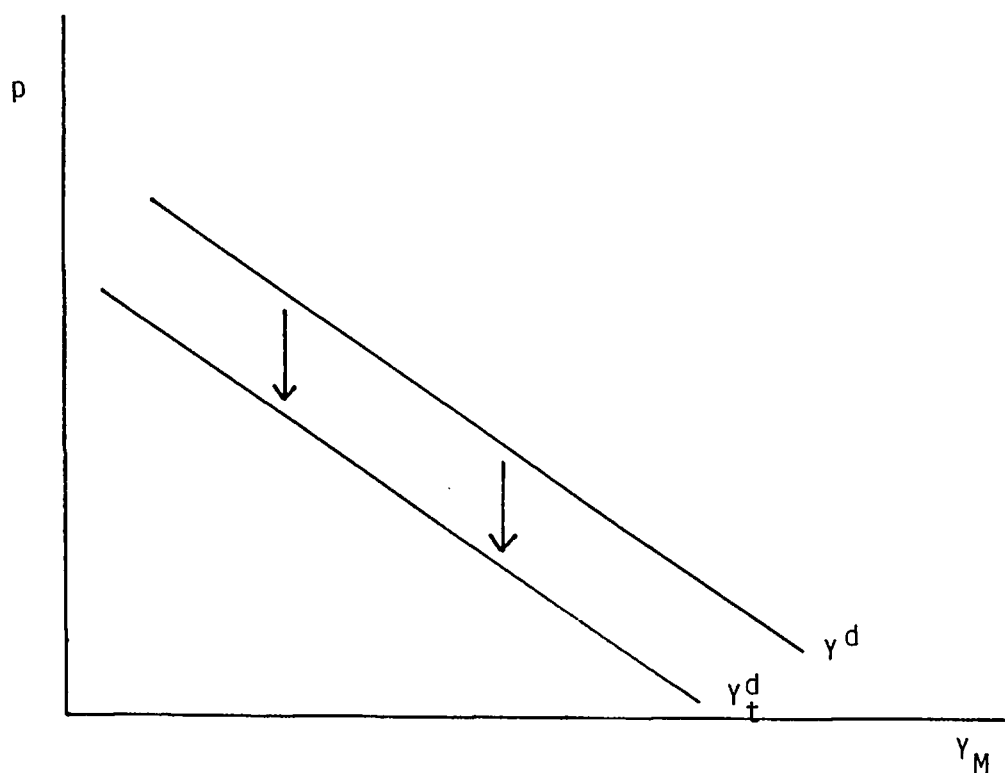
The effects of tax avoidance in the total model are shown in Fig. 12. In quadrant III the labor market is depicted according to Fig. 10. An increase in the tax rate causes a leftward shift of the totally inelastic commodity supply curve from Y^s to Y_t^s via the production function in quadrant II. In quadrant IV we have the iso-nominal wage hyperbolas before (W) and after tax (W_t)[26].

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26) In this model we assume totally flexible wages; later on, we will modify this assumption and deal with sticky nominal wages; see hereto FUHRMANN and ROHWEDDER (1983, pp. 94).

Figure 12: Effects of Tax Avoidance on
the Commodity Supply Curve
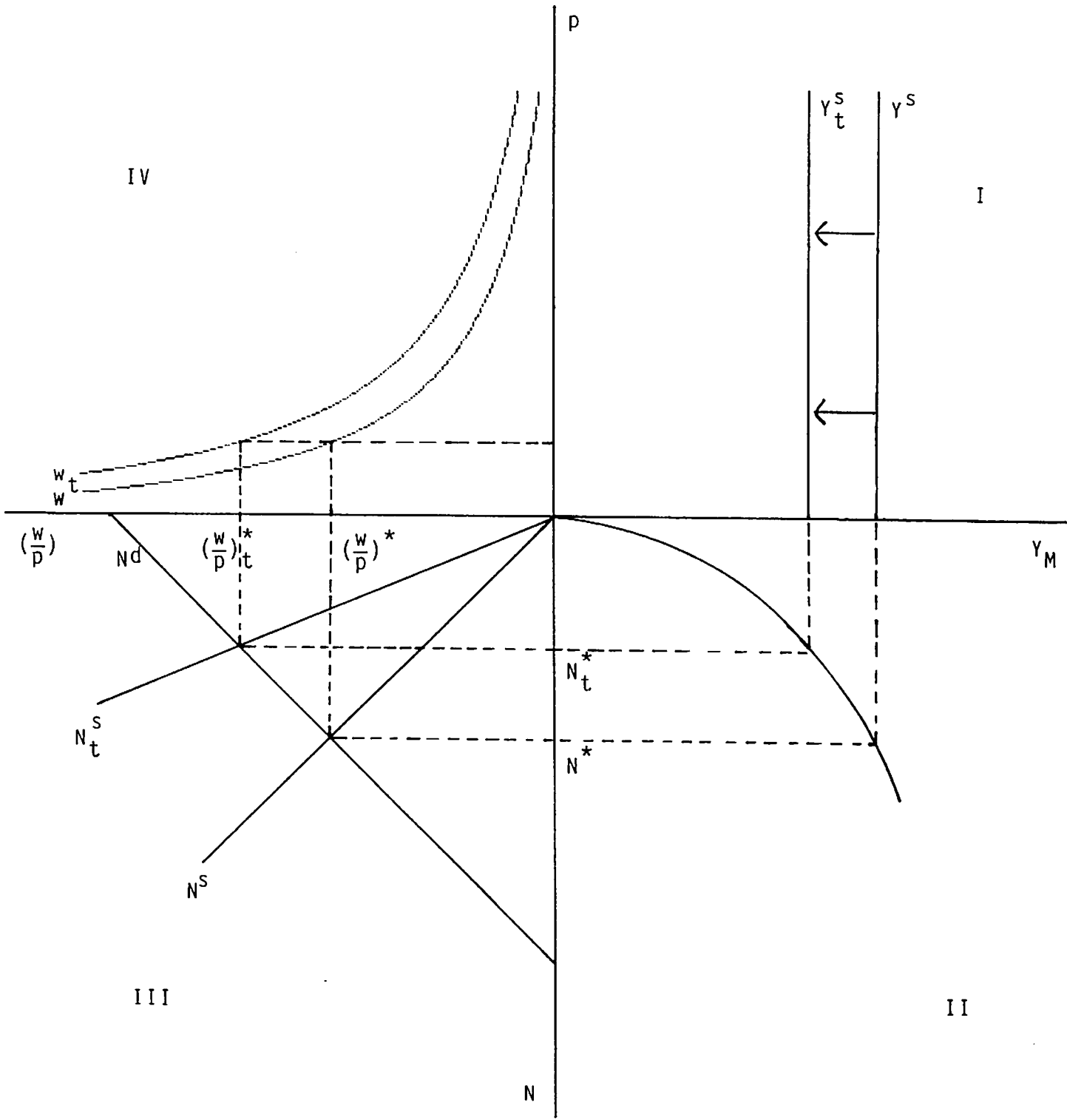
For simplicity, we will only consider quadrant I of our total model in Fig. 13[27]. Fig. 13 a illustrates the effects of tax avoidance with flexible nominal wages. Given a constant supply curve for commodities, the reduction of aggregate demand will bring about a decreased price level.

Whereas, if we assume sticky nominal wages (see Fig. 13 b), which means that there is a price elastic branch of the commodity supply function, the intersection may be below the maximum output level. As a result, the formal product Y_M as well as the price level P decrease. A deflationary process will be brought about, which, ultimately, will end in a KEYNESian equilibrium of underemployment.

Figures 13 c and d depict the effects of tax avoidance. Given flexible nominal wages, the formal product Y_M decreases with increasing prices. This process may be described with the slogan "stagflation", although there is no disequilibrium in the labor market. A similar process takes place in the case of sticky wages. In our example this process even removes a previously existing underemployment due to tax avoidance[28]. Figures 13 e and f show the combined effects of tax evasion and tax avoidance. In both cases, the formal income Y_M is reduced, whereby, given flexible wages, the direction of the change in price level cannot be found out. Given sticky wages, the price level drops (deflationary process) and an equilibrium of under-employment is attained.

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27) Out of the three "KEYNESian defects" (investment trap, liquidity trap, and sticky wages) we will only deal with the last one.

28) Thus, "involuntary" unemployment wouldn't exist any more. But the fact remains that the new equilibrium employment of labor is below the initial one ($N_t^* < N^*$, see Fig. 10). Yet, the negative deviation of employment from N^* can be thought of as "underemployment". "N^* alone represents a level of employment which is considered optimal for society by Classical, Keynesian, and perhaps all economists. If $N < N^*$, an increase in employment would benefit both those individuals willing to work and those persons who want to consume more commodities; hence such a situation cannot be Pareto-optimal" (FELDERER and HOMBURG, 1987, p. 108). Yet this underemployment would be caused by taxes.

Figure 13: Effects of Taxation on Commodity Demand and Supply Curves

(a) Tax Evasion at
Flexible Nominal Wages

(b) Tax Evasion at
Sticky Nominal Wages

(c) Tax Avoidance at
Flexible Nominal Wages
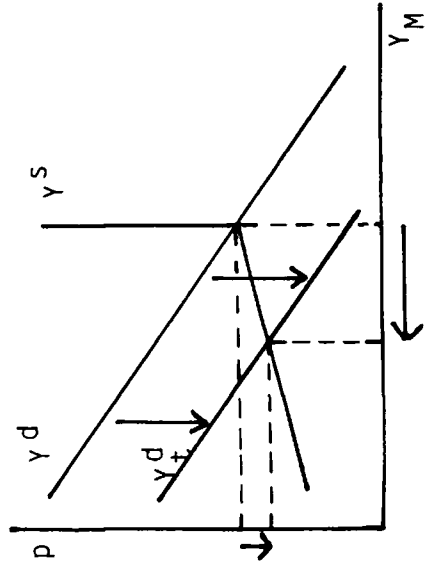
(d) Tax Avoidance at
Sticky Nominal Wages

(e) Combined Effects at
Flexible Nominal Wages
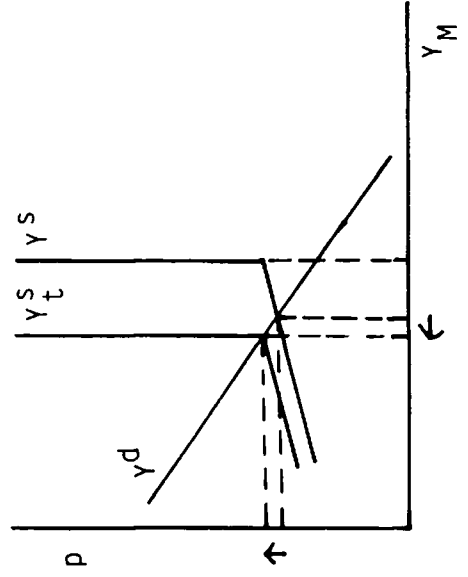
(f) Combined Effects at
Sticky Nominal Wages
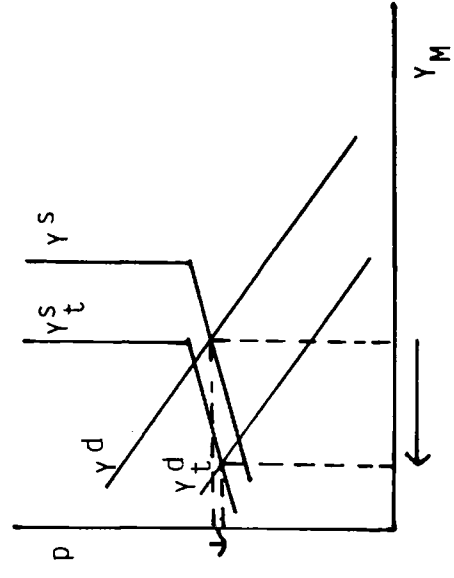
In the previous remarks, only pure effects of taxes have been considered. Now we want to assume respending and budget balancing in accordance with the IS/LM model. The demand curves Y^d will then shift to the right, according to tax revenue. In the case of tax evasion (see Fig. 13 a and b), deflationary tendencies will be weakened or compensated, depending on the strength of the opposed effects on commodity demand. In the case of tax avoidance (see Fig. 13 c and d), stagflationary tendencies will be clearly enforced[29]. The latter development is likely to take place when tax avoidance and tax evasion occur together. In the HAAVELMO-case, the probability increases that a stagflationary process instead of the positive multiplier process from the simple KEYNESian model is set off.

VI. FINAL REMARKS

(1) Our analysis of the effects of taxes in the simple IS/LM model has shown that tax avoidance and tax evasion imply increasing rates of interest and usually contribute to a reduction of the formal income. Increasing tax rates require an adjustment of the structure of private demand if disequilibriums are to be avoided. A decreased formal income implies only a minor reduction of total welfare because the supply of effort is increased in the shadow economy which leads to an increased informal income.

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29) This will only happen if wage earners don't consider public and merit goods as being perfect substitutes for their decreased private commodity demand; or if wage earners are subject to fiscal illusion or if groups other than the tax-affected benefit from the public commodity supply.

(2) If we consider the effects of taxes in the model of neo-
classical synthesis we can say that the additional demand
for money induced by tax evasion leads to a reduction in
the commodity demand, whereas tax avoidance, being a result
of increased taxes, leads to a reduction in the commodity
supply. In the HAAVELMO-case, stagflationary developments
become most probable.

(3) The theoretical reflections, represented here with the aid
of models, are, without doubt, unsatisfactory. We are
lacking a formulation of closed models, which, in turn,
require the solution of a number of formal problems first.
Above all, the effects of tax avoidance and tax evasion
should be examined when the assumption of budget balancing
is dropped, in other words, when a public debt is tolera-
ted. A differenciation regarding the kind of taxes is also
necessary, because "tax awareness" is not the same for all
taxes and therefore the adjustments in response to taxes
tend to be different. Effects on wealth should also be ex-
amined, especially when "illicit cash" becomes more impor-
tant[30].

(4) If we assume that the supply of effort (esp. labor) can
shift smoothly from the formal into the informal sector,
and vice versa, the problem of involuntary unemployment
doesn't exist any more. This statement holds only as long
as demand adjusts along the 45° line of our complete model.
If we drop the assumption of perfect information and
infinite velocity of adjustment, temporary disequilib-riums
are very likely to occur; then, we would also have to deal
with involuntary unemployment in the formal sector.

(5) The results yielded by our models stress the fact that un-
employment can be a structural rather than a cyclical phe-
nomenon. Without doubt, not all professions can sell their
resources likewise in the formal and in the informal sector

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30) Which sector will be influenced by these effects depends,
among other things, on the development of relative prices
between the sectors.

as we assumed. Thus, in a two-sector model, those in-
dividuals are involuntarily unemployed, whose labor supply
doesn't meet a demand in the formal sector, and whose
abilities (mostly obtained in the formal economy) cannot be
used for productive activities in the informal sector. In
this context, frustration, alienation, and so on, may play
an important role. Hence, structural employment is as
socially urgent a problem as cyclical unemployment, with
the difference that the removal of structural unemployment
is much more difficult. Labor in the informal sector,
though sometimes on the verge of legality, certainly in-
creases general welfare and therefore needs to be re-
evaluated.

(6) The results yielded by these rudimentary models cannot, of
course, be applied directly to real-world economics. But,
nevertheless, the results are important because they point
out which factors should be considered before political
decisions are made. Bearing the effects of tax evasion and
tax avoidance in mind, we can say that a supply-oriented
fiscal policy seems to be superior to a demand-oriented
fiscal policy, because the latter tends to cause stagfla-
tionary processes above all.

(7) In any case, the results show that it is necessary to dis-
aggregate the public sector in traditional macroeconomic
models and to integrate behavioral hypotheses which take
into account the effects of tax avoidance and tax evasion.
Whether the LAFFER curve or similar relations are adopted
can be decided when suitable empirical studies have been
made. As long as the trends of development in the informal
sector remain unknown because of the lack of statistical
date, economists will continue to depend on speculations
and anecdotal evidence. Studies on time budget as well as
the results of a socioeconomic panel, carried out by the
SONDERFORSCHUNGSBEREICH 3 of the DEUTSCHE FORSCHUNGSGE-
MEINSCHAFT and the DEUTSCHES INSTITUT FÜR WIRTSCHAFTSFOR-
SCHUNG, Berlin could, at least in the long run, contribute
to an improvement of data concerning the informal sector.

(8) Thus, this first attempt to analyze the effects of tax evasion and tax avoidance in a macroeconomic context yields interesting and important results. Perhaps a stronger microeconomic foundation of macroeconomic models could help to further improve their suitability for forecasting purposes. But, until then, a considerable amount of research work will have to be done.

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Chapter 2:

Shadow Economy

2.1.

Shadow Economy, Laffer Curve and Illicit Cash in Simple Macroeconomic Models

(10th Anniversary Edition of the Greek Journal of Political Economy, Athens 1990, pp 118 – 157, in Greek Language)

2.2.

Size of the Public Sector, Economic Growth and the Informal Economy - Development Trends in the Federal Republic of Germany

(The Review of Income and Wealth, New Haven/Conn., Series 28 (1982), pp 191 – 215)

2.3.

Taxes, Tax Systems and Economic Growth

(Herbert Giersch (Ed): Towards an Explanation of Economic Growth, Tübingen 1981, pp 313 – 347)

SIZE OF THE PUBLIC SECTOR, ECONOMIC GROWTH AND THE INFORMAL ECONOMY: DEVELOPMENT TRENDS IN THE FEDERAL REPUBLIC OF GERMANY*

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The growth of the public sector in the post-war period and the consequences of this development for economic growth is a strongly disputed subject of economic theory and policy. In this paper the development trends of state activities in the case of the Federal Republic of Germany are presented. The structure of public expenditures as well as the tax structure are taken into consideration and possible impacts on real economic growth are analysed. The negative correlations between some kinds of public expenditures (or taxes) and the growth rate of real GNP should not be taken in proof of the growth-retarding effects which might ensue from increasing state activities. It seems to be more likely that state activities have induced shifts of resources from the formal into the informal economy. Politicians should be aware that some measures of economic policy conventionally proposed will strengthen the movement into the informal economy, thus intensifying the current problems within the public budgets as well as in the social security system.

I. INTRODUCTION

1. Since the strong decline of the growth rates in many countries in the mid-seventies discussions of the influence of the public sector on economic activities have been intensified. To remove this growth retardation supporters of supply-side economics put faith in a substantial cut-back in tax rates as well as in public expenditures, whereas demand-side oriented economists advocate additional deficit-financed public expenditures especially to overcome the current world-wide recession. Opponents of supply-side oriented economic policy often argue that such measures would intensify the current malaise, whilst opponents of demand-side oriented economic policy fear that a crowding out of the private sector would be the only effect if deficit spending continues. The controversy about these two paradigms has an old tradition. But after a long lasting process of public sector growth especially during the last decade, perhaps there are some new prospects which could lead to further insights and a new judgement of economic policy measures conventionally proposed.

2. After World War II economic policy in the Federal Republic of Germany was mainly influenced by Keynesian thoughts, although fiscal policy measures were often implemented rather halfheartedly compared to pure theory. Today's time-series are long enough for the analysis of the long term development trends and to allow some speculations about causes and consequences. Because of its complexity economic growth is one of the most disputed themes in economic theory and policy. An isolated analysis of the effects of public sector growth on

economic growth is only of limited capacity for interpretation. It stands to reason that economic growth is influenced by many factors of both economic and non-economic character. Therefore we are fully aware of the limits of such simplifying analysis. But perhaps time-series analyses shed some additional light on the relation between the size of the public sector and economic growth.

3. But there might be another reason why our time-series originating from traditional national accounts statistics do not draw an accurate picture of the real state of today's economies: a growing discrepancy in the development of the official economy and the hidden economy, or—in Shankland's (1980) terminology—the formal and the informal sector of our dual economy. In pre-capitalistic times the informal economy was the dominating one. With continuing industrialization and labour division as the result of rapid technical progress, the informal economy has been shrinking and formal economy growing. Therefore the formal economy became the main subject of analysis in economic theory, whereas the informal economy has nearly been forgotten by economists as well as by statisticians. Consequently in our present national accounts statistics the informal economy is overwhelmingly neglected. But currently many people recognize an increasing number of symptoms which point to a turning-point in this development; the growth of the "underground economy" or—in a formulation which sounds more positive—the "unobserved sector" (Feige, 1982) is high on the agenda.

4. In part II we use national accounts data for the measurement of the share of state to official economic activities, expressed traditionally as ratio of total government expenditures to GNP; in addition to demonstrate the changes in composition of public expenditures, some structural ratios are analysed. Corresponding estimates have been made for the revenue side of the budget. Then some time-series analyses are represented to make plain the long term development trends between the growth rate of real GNP and the different ratios. In part III we make a very first attempt to examine critically the importance of the hidden economy in Germany and in part IV we speculate about its causes and consequences. The results are summarized in part V and some short remarks are made about the future tasks for public statistics as well as about the implications for future economic policy, the latter especially for the purpose of giving material for discussion and hints for future research.

II. Development Trends of State Activities

5. The ratios analysed in this chapter do not naturally represent the total field of state activities, but only that part which is expressed in public budgets. State activities also take the form of statutes, decrees, orders, prohibitions, etc., which are only partly or not at all expressed in public budgets. Because of this quantitatively invisible part of state activities there is a certain risk of misjudgement of the total extent of state activity in intertemporal but especially in international comparisons.[1] In default of a suitable measure for these state

[1]See Wissenschaftlicher Beirat (1976). One German example is the wage payment to employees during the first six weeks of illness paid formerly by health insurance and today by employers, thus shifting burdens from public institutions to the business sector.

activities, a simplifying proxy has often been proposed which might express very roughly the development trends of regulations: the quantity of legislation is measured as the annual number of pages of legislation published. This anecdotal measure shows a strongly increasing trend if federal legislation is taken into consideration: the average annual page number of the "Bundesgesetzblatt I" (in which overwhelmingly the legislation important for the German citizen is published) has been increased from 1,054 pages in the decade 1950 to 1960 over 1,442 pages in the decade 1960 to 1970 and 2,946 pages in the decade 1970 to 1980; the flood of legislation has nearly been trebled.

6. The classification of public expenditures and revenues follows the characteristics of the German national accounts statistics. Total expenditures (federal government, states, and local authorities including social insurance) are divided into expenditures for goods and services, transfer payments, and interest payments on public debt;[2] expenditures for goods and services are further divided into public purchases and personnel outlays. On the revenue side taxes including social security contributions are analysed as well as the single components: indirect taxes, direct taxes, and social security contributions. Time-series analyses are not done for the purpose of testing a certain hypothesis which afterwards will be rejected or—as most usual—verified. Our data used as well as our simplifying models—neglecting influences of important variables which are not taken into consideration— do not allow the test of causal relationships but make plain the long-term development trends. At the current state of the art there are not many alternatives which would yield better results.[3] Therefore we can only speculate about causes and consequences.

1. *Public Expenditure Trends and Economic Growth*

7. The development of the different expenditure ratios is represented in Chart 1. The total expenditure ratio increased from about 30 percent in the early fifties to about 46 percent in the early eighties.[4] Especially since 1960 a relatively steady increase can be observed which has accelerated since 1970 because of the "Reformpolitik" of the new social-liberal government which, in principle, should remove—following the Galbraith hypothesis—"public poverty." A further acceleration took place as a consequence of the great recession in 1974/75. Here developments a bit similar to Peacock/Wiseman's displacement effect can be observed: a sudden increase of the expenditure ratio which persists in a higher level after the crisis, altogether yielding an increase in the expenditure ratio of roughly 9 percentage points.[5]

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[2]The total expenditure ratio is not a "true" ratio but more a relation because transfers are not included in the GNP; see Littmann and Krüger (1975).

[3]Using more sophisticated methods (e.g. factor analysis) leaves us at the "black box" stage of research into public expenditure growth, too; see Peacock and Wiseman (1979).

[4]Many economic causes for the increasing expenditure ratio have been discussed in the German literature and are not represented here; see, e.g., Recktenwald (1977), Albers (1977), and Felderer (1977).

[5]Roughly 1.5 percentage points of the increase in the expenditure ratio since 1975 are due to the shift from child exemptions in income tax to child benefits, thus only resulting in an increase of both sides of the budget.

CHART 1. Post-war Developments of Expenditure Ratios

Percent of GNP
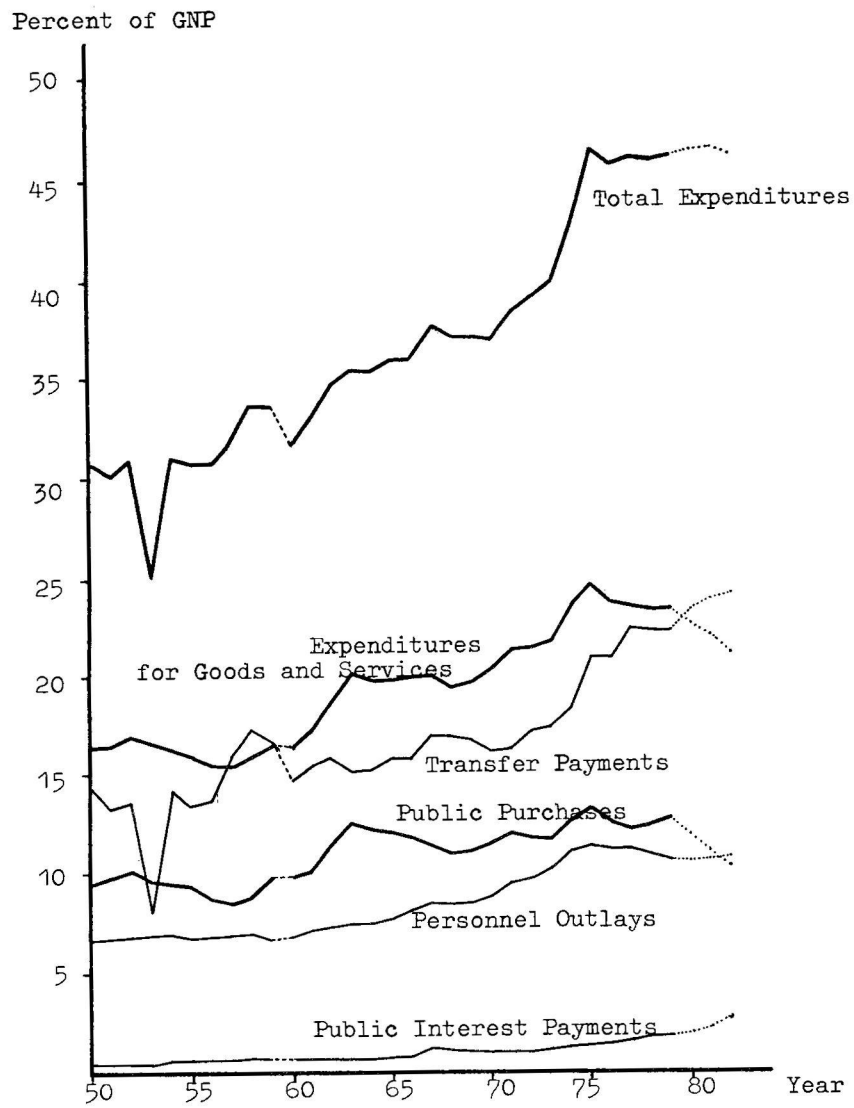
Source: Statistisches Bundesamt: Volkswirtschaftliche Gesamtrechnungen, various issues.

194

8. Similar developments can be observed for the structural ratios. The ratio of expenditure for goods and services also increased, but much less than the ratio of transfer payments. The public purchases ratio is nearly the same in the early fifties as in the early eighties. Taking different developments of the price indices for the public sector and the private sector into consideration, we also estimated real expenditure ratios to real GNP using appropriate deflators for the different components of public expenditures.[6] The development of the real ratios of expenditures for goods and services and transfer payments is of particular interest: Whereas the real expenditure ratio for goods and services has been a bit higher in the early fifties (around 22.5 percent) than in the late seventies (around 21.5 percent) and remained relatively constant in the meantime, the real transfer ratio increased strongly from around 10.8 percent in 1950 to 20.6 percent in 1980, thus signifying nearly a doubling during the post-war period.

9. The correlation coefficient between the real expenditure ratio and the real transfer ratio (R = 0.96) shows a close connection between the development of these two ratios.[7] The growing transfer budget has overwhelmingly caused the enlargement of the German public sector, and social transfers make up by far the biggest part of it. This development took place especially because the expenditure elasticity within the social security system has been increased by nearly all post-war reforms,[8] and spreading pressure groups in the household as well as the business sector have been very successful in defending old privileges and adding new ones.[9]

10. Here economic growth will be measured as the annual growth of the real GNP. The annual growth rate of real GNP shows a decreasing development in the post-war period as opposed to the total expenditure ratio. And the estimated expenditure ratios are themselves dependent on the GNP. These additional arguments should give rise to a very careful interpretation of our regression estimates represented now. Chart 2 shows the scattergram of the real growth rate and the real ratio of total public expenditures, both in 5-year-moving-averages. A strongly negative correlation can easily be observed, grouped in three periods: 1955 to 1964, 1965 to 1974, and 1975 to 1982.

11. The simple and multiple regression results are represented in Tables 1 and 2 in the Appendix. Concerning the nominal expenditure ratios the adjusted R square ($\bar{R}^2$) points to a relatively close negative correlation between the real growth rate of GNP and the total expenditure ratio as well as the structural ratios of expenditures for goods and services. In the case of the real expenditure ratios there is only a limited significance for a negative correlation between real growth rate and the total expenditure ratio as well as the ratio of transfer payments. In the multiple regression estimates there are only relatively significant correlations for the total expenditure ratio (nominal) and the ratio of transfers (real).[10]

[6]For the method see, e.g. Felderer (1977 and 1979), Beck (1979).
[7]The correlation coefficient for the connection between the real expenditure ratio and the real expenditure ratio for goods and services is R = 0.29.
[8]See, e.g. Jüttemeier and Petersen (1982).
[9]In particular the ratio of subsidies to GNP increased by around 134 percent from 1960 to 1980; that is the highest increase on the expenditure side of the budget.
[10]The implementation of time lags shows that with a lag of up to three years signs stay overwhelmingly negative. Using 5-year-averages leads partly to an increase in R^2 values.

CHART 2. Scattergram of Real Growth Rate of GNP and Real Expenditure Ratio
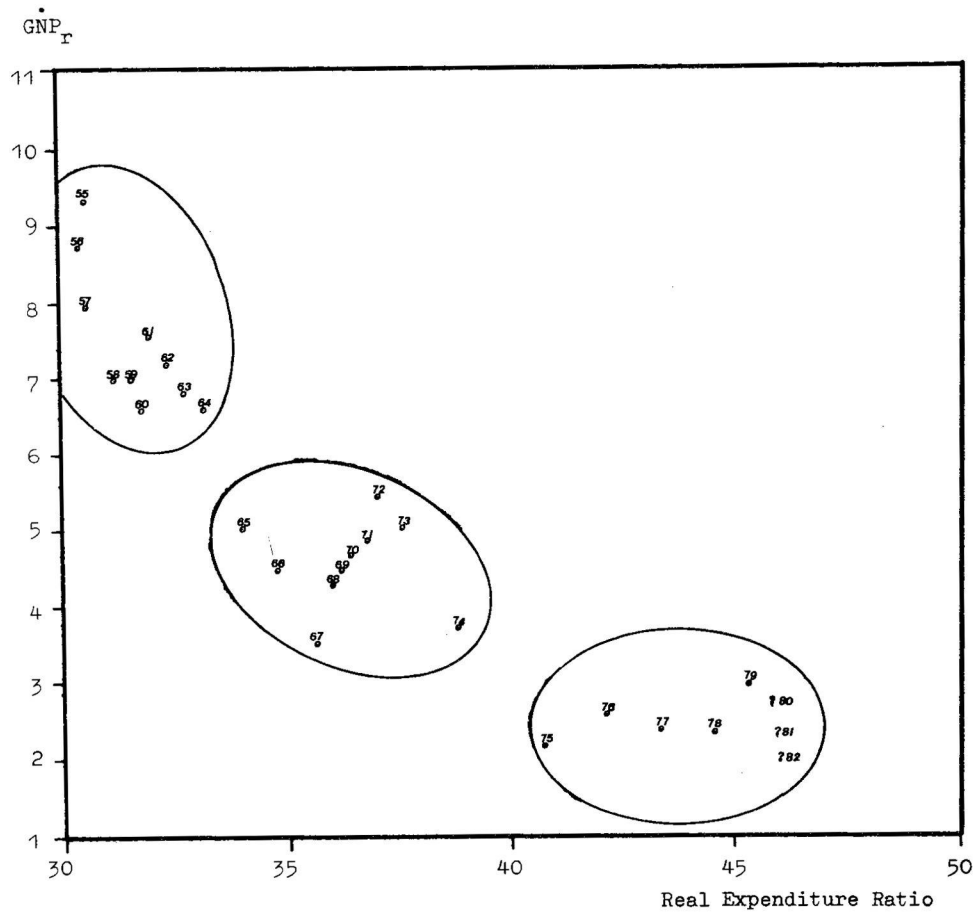
Source: see Chart 1.

2. *Tax Structure and Economic Growth*

12. In Chart 3 the development of the ratio of total taxes to GNP, the ratios of indirect and direct taxes and social security contributions, as well as the ratio of the wage tax (income tax for employees which has become the most important direct tax) is shown. Additionally public surpluses and deficits are represented; since the seventies the latter have become the rule. The total tax ratio has increased from around 30 percent in 1950 to around 42 percent in 1980 and strong changes in the tax structure can also be observed. The indirect tax ratio was on the average during the fifties a bit higher than it has been since 1960, whereas the direct tax ratio steadily increased, interrupted only by casual tax rate reductions. The wage tax ratio in the late seventies is about four times what it was in 1950.

13. The comparatively constant indirect tax ratio reduces to the prevailing proportional tax rates, whereas the income tax schedule is progressive. The increase of the direct tax ratio is due to the effects of inflationary and real income growth because exemptions and tax schedule have not appropriately been adjusted especially for inflation. The social security contribution ratio also increased strongly, nearly in the same extent as direct taxes, but this growth was caused by discretionary contribution rate increases to prevent deficits in the social security system which otherwise would have been created in consequence of the use of pay-as-you-go financing.

14. Between the real growth rate of GNP and the total tax ratio there also exists a negative correlation (see Table 3 in the Appendix). Compared to the expenditure ratio the connection seems to be less strong. The cause might be the increasing importance of public deficits in financing public expenditures, whereas direct tax rates have been casually reduced. But nevertheless, there are negative correlations between the real growth rate and the direct tax ratio as well as the social security contribution ratio. On the other hand the positive sign of the indirect tax ratio points to a positive correlation which could lead back to the slight decrease of the indirect tax ratio during the post-war period. In the multiple regression equations only the sign of the social security contribution ratio changes, but all are not statistically significant.

3. *Some Suppositions about State Activity and Growth*

15. In principal, two hypotheses could be formulated to be tested in the preceding analyses: (1) because the growth rate has decreased, the public expenditure ratio has increased (Keynesian hypothesis), and (2) because the public expenditure ratio has increased, the growth rate has been depressed (Neoclassical hypothesis). The problem is that it is only possible to confirm, and not to reject, both hypotheses using simple time-series analyses. And for both hypotheses one can find some supporting *ad hoc* arguments. In Germany the Keynesian hypothesis is based on the arguments that the period of reconstruction has been finished and the first signs of saturation can be observed accompanied by a change in norms, that is to say a new orientation from material to non-material values. But the resulting decrease in the growth rate is taken as a symptom of an economic crisis by government and bureaucracy, both still following the

197

CHART 3. Post-war Developments of Tax Ratios and Surplus/Deficit Ratio.

Percent of GNP

Source: See Chart 1.

198
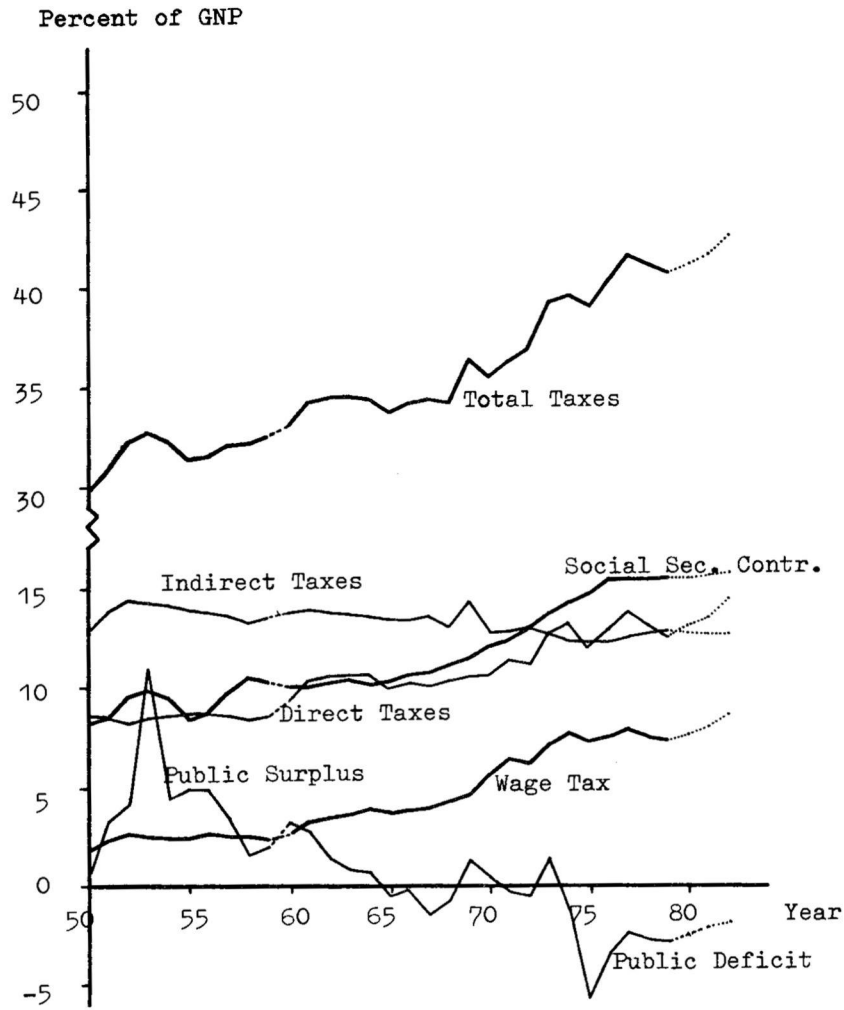
traditional aims. Therefore public expenditures will be increased to overcome the current growth retardation, but because we are confronted with a secular trend, such economic policies do not lead to a substantial growth enhancement but to a strong increase in the public expenditure ratio.

16. The Neoclassical hypothesis is based on the conception that politicians and bureaucracy are both interested in a growing public budget, thus increasing their power and influence, and politicians will use the expenditures especially to favour their voters and the related pressure groups. This process and the Keynesian policy described above shift resources from the private (business) sector to the public sector. Because public sector productivity is less than business sector productivity (if not zero or even negative in the case of redistributive activities) the growth of public expenditures leads to a growth retardation in the total economy.

17. Perhaps both simple hypotheses together could provide an explanation applicable to the post-war developments. High growth rates in the two decades after World War II accompanied more or less by secular inflation lead to an increasing tax yield resulting especially from the progressive income tax system.[11] Plenty of tax revenues might have caused politicians and the bureaucracy to increase expenditures particularly for social security because that kind of public expenditure is seen as a benefit by the recipients who have no concrete knowledge about the financing aspects. Naturally, many very important social reforms have been made, but since adding to existing programs is politically far easier than reducing or replacing them, few programs are ever re-examined. As long as growth rates were sufficient no serious pressures were created to do such a re-examination. Thus transfer payments to households as well as to the business sector increased, although the net redistributive effect, especially of social transfers, is dubious.

18. Whereas redistributive activities of state authorities have been strongly increased, their influences on private investments and savings are less important than often supposed.[12] The cause could be seen in the development of net burdens of the household and the business sector. Chart 4a shows the development of the tax ratio of the business sector[13] related to the gross value added of the business sector, the ratio of subsidies and the ratio of net burden. From 1960 to 1980 the tax burden increased but subsidies, too, increased thus yielding an increase of the net burden ratio of the business sector compared to the mid-sixties. The development of the household sector ratios is presented in Chart 4b, all related to the gross income of employees. The tax ratio[14] has been at least partially offset by rising transfers.[15] Compared to the early sixties a clear increase can be observed especially if the reform of child benefits is taken into consideration, which has led to an increase of transfers partially due to a simple expansion of both sides of the budget. The increase results from the growing

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[11]The elasticity of the total tax system has been around 1.2 in the post-war period.

[12]See Neumark (1981) and Petersen (1982).

[13]Income tax on profits, corporation tax, employers' contributions to social security system, etc.

[14]Wage tax, employees' contributions to social security system, value added tax, excise duties, etc.

[15]The transfer ratio is also influenced by the income tax reform of 1975; see above (footnote 5).

Percent of Gross
Value Added
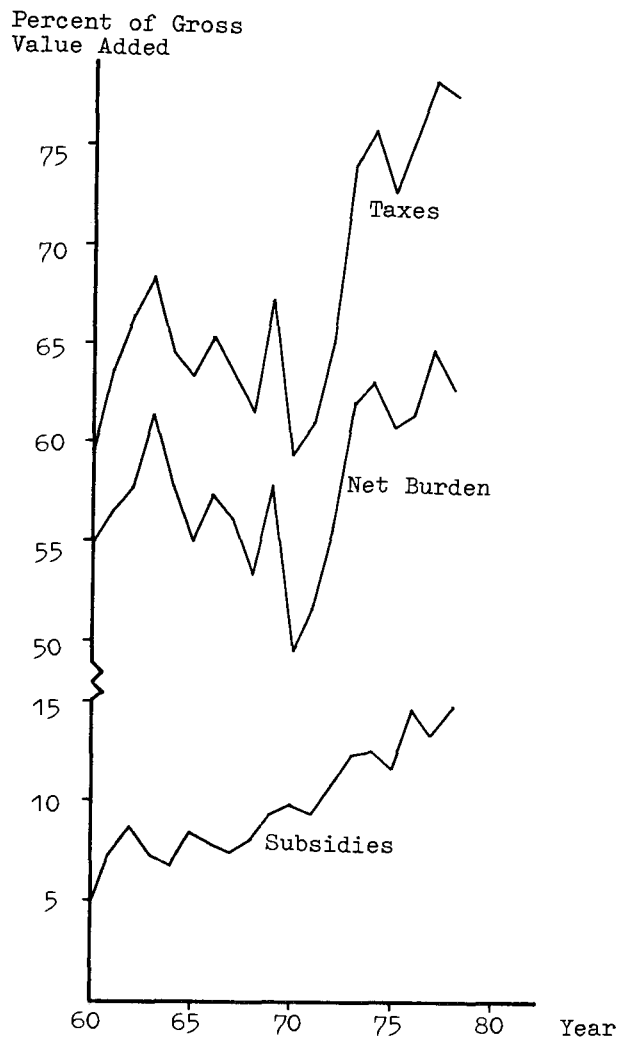
Source: See Chart 1.

CHART 4b. Household Sector Ratios

Percent of Gross Income
of Employees
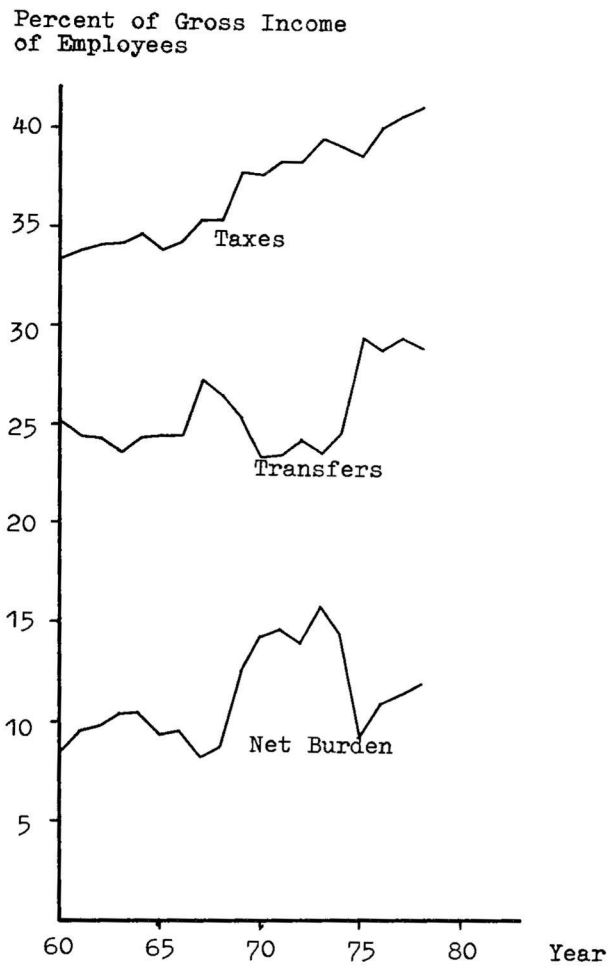
Source: See Chart 1.

burden of wage taxes and social security contributions imposed prevailingly on the working generation within the lower and middle income brackets.

19. Because the net burden of the business sector and the higher income brackets increased less, it is likely that savings and investments are more dependent on other influences than on taxes. If investments should have been depressed by increasing public activities, this could lead back rather to the crowding out effect of strongly growing public deficits. But which consequences might follow out of the increased net burden for employees' households? With increasing tax burdens compliance with direct taxes and contributions will be impaired, and the imperceptibility of indirect taxes ("indirect tax illusion") will disappear. Resistance against taxation will increase, thus inducing politicians to increase deficits which are needed to finance especially the ever increasing expenditures for social security. The high elasticity of transfer payments can only be reduced by a substantial reform which is not very likely. The resistance of pressure groups is very strong and a majority of politicians fear losing their reputation because substantial reforms are often defamed as "social cutback" by interest groups and large parts of the mass media. And long term political perspectives for social reforms are as badly needed as they are regrettably absent.

20. Social security in the present form has become a "social property" (sozialer Besitzstand) irrespective of the more than dubious redistributive effects which are created by today's system and irrespective of the future financial problems which will occur. Zero pricing for public goods and increasing transfers have impaired the consciousness of citizens that all public expenditures have to be financed by citizens themselves. Consequently claims against the anonymous state have increased, often supported by pressure groups which are increasingly important and which have been able to generate the impression within their membership that costless benefits are to be expected. These illusions, leading to additional expenditure pressures on the one hand, have particularly caused the growing tax burden on the other hand. Both taxes and transfers certainly influence the attitudes of individuals, although currently the real extent of the disincentive effects cannot be exactly evaluated.

21. Because of growing transfer payments and an increasing tax burden it is likely that disincentives especially in the lower and middle income brackets have been intensified and that today disincentives in these brackets are much more important than in the upper income brackets.[16] Additionally knowledge is spreading that many redistributive measures shift public means without net effects—only with an employment effect for the bureaucracy involved. As the result of the complexity in social law as well as tax law a majority of citizens do not understand the system, whereas for a growing informed minority the system has become exploitable. The moral hazard in taking advantage of the social security system on the one hand and growing tax resistance on the other hand will lead to a growing discontent with the state and representing government, the first symptoms of which can be easily observed. In Germany we have reached a high living standard; therefore it is likely that the substitution effect of taxes

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[16]Marginal tax burdens (including social security contributions) for middle income groups are considerably higher than for higher income groups; see Petersen (1982).

(and transfers) dominates the income effect of taxation. Because the income of employees is taxed at the source, tax evasion is impossible. Substituting (taxed) labour for (untaxed) leisure is only one possibility for avoiding taxation available to employees; switching from the formal economy into the informal economy is another. This possibility—meaning that resources are legally or illegally withdrawn from the formal economy, thus influencing its growth potential—will be analysed in the following chapters.

III The Hidden Economy in Germany

22. There are various different kinds of activities within the hidden economy. Beginning with the illegal activities of tax evasion and fraud, illicit work and black-market (barter) transactions up to legal activities as domestic work (done by men and women or spouses and children), do-it-yourself activities, neighbourhood aid and voluntary work gratuitously done in social welfare institutions, political parties, clubs, non-profit organizations etc. Most of these activities are not expressed in our national accounts statistics, but contribute to society's total welfare. As long as the informal economy is growing proportionally to the formal economy, the real growth rate of GNP might be an appropriate measure for the increase (or decrease) in total welfare (see Feige (1982)).

23. Only if the informal economy is growing faster than the formal economy is traditional real growth rate of GNP misleading in measuring the growth of total welfare. But the current problem is how to get a correct diagnosis considering the fact that suitable statistics are not available. Estimates comparable to those made by Eisner (1978) and Kendrick (1979) for the United States including major imputations have not yet been made for the Federal Republic, and we are just starting with first estimate of the "monetary unobserved sector" following the framework of Feige (1982). Therefore it is only possible to give some very preliminary results and some anecdotal information which demonstrate simultaneously the lack of useful data.

24. A very rough measure of the monetary unobserved sector is the estimation of the discrepancy between the income reported to the fiscal administration (published at three year intervals in the German income tax statistics) and the national income of the national accounts statistics. But in the two sets of statistics income is grouped in different ways[17] so that a comparison is restricted to two components: (1) the income of employees and (2) other income (i.e. income from agriculture and forestry, from business, of self-employed persons, from private capital assets, and from leasing). For the period 1961 to 1974 data are available which show that between 72.7 percent and 78.6 percent of national income has been reported to the fiscal administration (see Table 4 in the Appendix). But this difference is not due to illegal underreporting; it includes all existing tax concessions. Considering the adjusted income of employees,[18] underreporting has been between 9.0 percent (in 1961) and 2.1 percent (in

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[17]Income tax statistics follow the definition of the taxable base in the German income tax law which is not compatible with national accounts statistics.

[18]Data of the income tax statistics adjusted for employers' social security contributions and voluntary social service payments of firms; see Albers (1974).

1974). This declining trend demonstrates that taxation at the source has worked successfully.

25. Other income is overwhelmingly taxed by assessment procedures; here between 60.3 percent and 65.1 percent has been reported to the fiscal administration. Using the German "report of subsidies" (Subventionsbericht) and similar data we tried to estimate which part of underreporting is due to legal concessions.[19] In Table 4, other income adjusted by the income tax base which corresponds to the different tax concessions is also shown. Here a declining trend in underreporting can also be observed, but underreporting is considerably higher than in the case of employees' income, thus pointing to the fact that, if assessment is used, there are more possibilities for underreporting. But the declining trend is particularly caused by strongly increasing tax concessions. The unexplained remainder, which—apart from certain failures in our data and rough estimates—corresponds approximately to the illegal underreporting of the taxable base, amounts to 16 percent of national income in 1961 and 4.8 percent in 1974. By and large the German fiscal administration has worked effectively compared to developments in other countries.

26. But the unexplained remainder is a very imperfect measure of the monetary unobserved sector because it neglects essential parts of unobserved activities, especially the development of illicit work and do-it-yourself activities. Since in these areas currency is particularly used as medium of exchange, a simple currency-demand deposit ratio is often used as proxy for the monetary unobserved sector (see, e.g. Gutman (1977)). It is obvious that this measure is a very weak one. But strong changes in a long-term trend, thus pointing to changes in paying habits using currency instead of demand deposits, at least could be interpreted as a symptom of an increasing informal economy, although currency is not the only medium of exchange used within the informal sector (see Feige (1982)).

27. In Table 5 in the Appendix the German currency-demand deposit ratio is presented for the post-war period. This ratio shows a declining trend only interrupted by some small increases. The decreasing ratio is the result of the increasing use of demand deposits (spreading cashless payment) in the post-war period. As opposed to the development in the United States this trend is going on because of a further growing use, for instance, of Euro-checks and credit cards. The late introduction of credit cards in Germany compared to the United States on the one hand and the use of demand deposits for "black market transactions" on the other hand might have slowed a change in the trend, but a reduction in the rate of decline is obvious.

28. Both imperfect measures do not support the hypothesis of a growing monetary unobserved sector in Germany and estimates of the development of the "non-monetary unobserved sector" (Feige (1982)) as made by Kendrick and Eisner for the United States revealing a dramatic growth in this sector relative to observed income as well as suitable micro observations are not yet available. Because our research project is in the very first phase, today we have only some anecdotal evidence which has its own relevance. Do-it-yourself activities have

[19]I wish to thank my colleague Karl Heinz Jüttemeier who placed the data of tax concessions at my disposal; see Jüttemeier (1982).

become popular in all classes including the well-to-do; home-worker service markets are spreading out and at present roughly two-thirds of tool sales are made to non-professionals compared to about one third in the fifties. The craftsmen's association often complains of the negative impacts resulting from these activities on the handicrafts branch, but particularly about the influence which illicit work might exert on the employment situation in this branch. In the early seventies around 70 percent of new home buildings in rural areas have been produced using illicit work, and at present nearly all buildings in the countryside are produced by do-it-yourself and illicit work. Planning as well as the procedure of permission is overwhelmingly done by public employees as a legal side-line (see Aberle and Eggenberger (1979)).

29. Fines for illicit work increased strongly from DM 1.4 Mill. in 1976 to DM 3.7 Mill. in 1980. This small amount shows that only the peak of an enormous iceberg is punished. The total extent of illicit work in the handicrafts branch is estimated at around DM 35 Bill. in 1980, that is roughly 10 percent of its turnover. A slightly increasing trend is prognosticated by the craftsmen's association, but their interest in illicit work is heavily influenced by the business cycle.

30. The low participation ratio especially of married women older than 35 years, in comparison with other developed countries (see Albers (1980)) as well as the tendency of the German trade unions in demanding more leisure (35-hours-week) and an earlier retirement age point to the fact that a considerable do-it-yourself and illicit work potential exists and will strongly increase if trade unions are successful in realizing their demand. The present high level of unemployment increases informal sector potential, too, and many people are surprised that the substantial increase in unemployment has not been accompanied by strong protests but by widespread acquiescence (see Shankland (1980)), perhaps due partially to the relatively high level of living resulting from the combination of unemployment benefits and informal sector activities.

IV. Causes and Consequences of the Informal Economy

31. Apart from the problems in measuring the development of the informal sector, we will speculate about possible causes which have led or will lead to an increase of the informal sector relative to the institutional economy, and about the consequences for economic and social policy. The main causes have already been presented above: strongly increasing transfers connected with a strongly increasing tax and contribution burden especially for lower and middle income brackets. In several cases shifting from official labour to social welfare and informal economy lead to higher net incomes in the lower brackets with only the constraint that official property is not accumulated, a factor which is not very important in these income brackets.

32. Because people show a behaviour which has economic consequences if they are moving into social welfare, retirement, or doing illicit work instead of official work, society is pressed to criminalize these activities,[20] thus introducing new laws and regulations which are overwhelmingly ineffectual but improve the

[20] In recent years several laws have been designed especially by conservative politicians to reduce illicit work.

existing jungle. And all this because we are obviously unable to remove defects within our tax and transfer system which have been created in the historical development process.

33. In the opinion of many politicians illicit work is dangerous for the state as well as for economic and social policy, but this opinion is apparently not shared by the total population. Perhaps therefore the German panel of economic experts (Sachverständigenrat) (1980) has written about the "economia sommersa": "The official economy following the pressure of the division of labour has certainly imperfections which in certain cases might be reduced by the informal economy ("Schattenwirtschaft"). The informal economy produces without distortions resulting from taxes and contributions as well as excessive regulations. Since the informal economy rather promotes than injures social consensus, this might have led to a certain toleration of this sector. It would not be an appropriate response to combat this sector with rigorous legislation. Fair tax rules are preferable. But if shifting into the informal sector would become a matter of course, there is no time to be lost."

34. Without doubt, a strongly increasing informal sector and shrinking formal economy would create substantial financial problems for the public budget, especially for social security because the existing system is dependent on real growth of GNP.[21] But that does not necessarily mean a serious danger because politicians and the bureaucracy would be forced to change expenditure behaviour and to reform the social security system. Beyond this, real growth of GNP is not necessarily affected by the growth of the informal economy, especially if service sector and similar activities with low productivity and a low degree of division of labour are shifted whereas activities with high productivity (using economies of scale) remain in the formal economy.

35. Within the informal sector the responsibility of the citizen for his own work as a rule strengthens his motivation. Because of the lower degree of division of labour what we call "Selbstverwirklichung" in German is easier and the alienation from work often observed in the formal economy is not present. Thus the increase of the informal economy would mean an improvement of working conditions, meeting the demand for more humanity at work. All these facts increase total welfare but are hard to evaluate.

36. But apart from these advantages of the informal economy the fact remains that a strong increase of the informal sector induced by an economic and social policy which neglects the existence of an informal sector could be dangerous: if public policy goes on using Keynesian measures for enhancing the growth of the formal economy this will require additional revenues (taxes or debt) which will strengthen the movement into the unobserved sector, thus reducing public tax revenues and increasing public deficits. Following the lines of supply-side economics would be less dangerous because reductions particularly in marginal tax rates within the lower income brackets etc. would diminish the incentive to shift into the unobserved sector, especially if transfer payments without net redistributive effect are simultaneously removed.

37. A supply-side oriented economic policy will only succeed if the movement into the informal sector can be stopped or—if a mass movement has already

[21]See, e.g. Petersen (1981a).

206

happened—can be turned back. But if we are confronted with a secular trend which results from a new-orientation from material to non-material values, in the long run these measures will fail, too. Then new forms of economic and social management will be implemented which perhaps are similar to methods used in pre-capitalistic times, or perhaps are totally unknown at present. But because such methods must be developed slowly, current economic policy should not accelerate these developments.

V. SOME FINAL REMARKS

38. Our analysis has shown that certain negative correlations exist between public expenditure and tax ratios on the one hand and the growth rate of real GNP on the other. But these correlations are not necessarily a symptom that state activities in total have growth-retarding effects especially if the existence of an informal sector is taken into consideration. However, it is likely that state activities have induced shifts of resources from the formal into the informal economy, whereas the effects on the growth of total welfare are difficult to evaluate.

39. If the informal economy is increasing and the formal economy shrinking, this development is not necessarily dangerous for our societies. In view of the positive aspects involved in this development apocalyptic visions about the danger of the current state activity for a free society (see, for instance, Brunner (1978)) at least seem to be a bit exaggerated. Opportunities as well as risks are included; the informal economy works like a valve: if government is going beyond certain limits, naturally difficult if not impossible to determine, citizens will react. They have the possibility to vote with their feet, i.e. to escape into the informal sector, thus limiting government sector in a certain way.

40. But apart from this "automatic stabilisation effect" of the informal economy, in our current economic and social policy we should consider the existing informal economy because otherwise a threatening acceleration of movement into the informal sector might be possible, thus leading to serious crises in the public budget and the social security system. To prevent such developments, we need additional information about the current state and the probable future development of the informal economy because our existing statistics are not useful for this purpose.

41. Particularly we need enlarged national accounts statistics comparable to Eisner's total income system of accounts (TISA). And this system has additionally to be harmonized with our existing tax statistics. Beyond this we need useful statistics of income distribution, also taking account of the existence of an informal sector; it is often supposed that informal sector income is distributed in favour of the lower income groups, thus indicating that perhaps total welfare is distributed more equally than formal sector income (see Feige, (1982)). For this purpose we need regularly collected survey data and user analyses. Besides these micro data, some additional information for macroeconomic approaches to determine the trend of development as, e.g., in Feige's framework is necessary.

42. This is more than the usual plea for more data; it is a plea for a useful public statistics. In Germany we are counting even the last animal in agricultural

207

statistics and even the egg-shells which are wasted in bakeries in our handicrafts statistics, but data which are wanted badly for important economic analyses are not available. Here a shift of resources is more than necessary.

43. Apart from the current state some conclusions for economic policy can be drawn. Politicians and the bureaucracy should be fully aware that we are approaching the limit at which the burden imposed on the employed generation will create serious disincentive effects. Up to now government rather welcomed the additional (overwhelmingly inflationary) tax revenue and used it for further increases in public expenditures, with the consequence that at least for some periods inflation accelerated. The inflationary process did not only lead to a declining money illusion, but to an increasing "tax awareness' (or declining "tax illusion"), too.

44. Therefore it seems to be senseless to substitute indirect for direct taxes to lower possible growth-retarding pressures, because with an increasing share of indirect taxes their imperceptibility disappears. Just as the money illusion decreases with an increasing rate of inflation, so the "indirect tax illusion" decreases with an increasing share of indirect taxes. Beyond this indirect taxes (as well as the expenditure tax) promote the movement "back to barter" and "back to nature," because do-it-yourself and barter transactions would become more lucrative,[22] so that eventual positive effects on the growth of formal economy could be compensated for.

45. Particularly a reduction of marginal tax rates for lower and middle income brackets accompanied by an inflationary adjustment scheme seems to be necessary and could be financed by abolishing the numerous loopholes within the German income tax system.[23] Also harmonizing the tax and transfer system through an integration of social concepts into the income tax system can lead to a widening of the tax base, avoid cumulative side effects of different kinds of transfer payments as well as combined marginal tax-transfer rates which are often higher than 100 percent, and so contribute to a stronger realization of the principle of "vertical equity." A comprehensive tax base would give the financial scope for reducing tax progressivity and especially for reducing the disincentive effects in the lower and middle income brackets, thus canalizing the movement into the informal economy in calm paths.

46. However, we do not want to repeat the favourite song of some neoclassically oriented economists which runs "to give market a chance," whereas some of them often intend exclusively a real "social cutback." Perhaps society is moving in the opposite direction. Even Schumpeter (1918), currently often quoted by Neoclassical economists, was not totally sure about future developments, but he wrote in *Crisis of the Tax State*: "The first premise for the socialized society is that capitalism has done its work and that with the help of entrepreneurs a strongly rationalized economy exists, so that one can look forward in peace to the inevitable slowdown in economic development, because socialism means the liberation of life from the economy, turning off the economy." And later on he continued: "By and by private enterprise will lose

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[22]Especially in the case of personal progressive expenditure taxes; see Petersen (1981b).

[23]Here one has only to mention the numerous articles written on a comprehensive tax base.

its social purpose because of the development of the economy and the increasing social sympathy. Society is outgrowing the private enterprise and tax state: That is sure!" We are not as sure as Schumpeter 60 years ago, but we think that we have to keep this possibility in mind.

Appendix

TABLE 1

REGRESSIONS FOR THE RATIOS OF TOTAL EXPENDITURES E^t, EXPENDITURES FOR GOODS AND SERVICES E^{g+s}, TRANSFERS TR, INTEREST I, PURCHASES PUR, AND PERSONNEL OUTLAYS PER (IN NOMINAL AND REAL TERMS)

Variable	Coefficients		N	R^2	F	DW
E^t	17.539	-0.337	32	0.385	20.379^1	1.448
E^{g+s}	18.908	-0.695	32	0.441	25.491^1	1.602
TR	14.961	-0.617	32	0.264	12.102^1	1.252
I	7.557	-2.158	32	0.133	5.760	1.167
PUR	20.390	-1.361	32	0.382	20.190^1	1.580
PER	15.055	-1.150	32	0.402	21.818^1	1.467
E_r^t	22.304	-0.459	32	0.356	18.121^1	1.329
E_r^{g+s}	19.831	-0.704	32	0.040	2.285	0.965
TR_r	13.563	-0.553	32	0.341	17.053^1	1.386
I_r	7.557	-0.216	32	0.133	5.760	1.167
PUR_r	6.846	-0.141	32	-0.031	0.054	0.984
PER_r	32.815	-3.087	32	0.245	11.067	0.994

Source: Calculated from Statistisches Bundesamt: Volkswirtschaftliche Gesamtrechnungen, various issues.

[1]Significant at 1 percent.

TABLE 2

MULTIPLE REGRESSIONS FOR THE EXPENDITURE RATIOS

No.	Constant	E^t	E^{g+s}	TR	I	PUR	PER	N	R^2	F	DW
(1) Nominal	17.539	−0.337 (20.379)[1]						32	0.385	20.379[1]	1.448
(2) Nominal	26.272		−0.624 (9.274)[1]	−0.800 (3.034)	3.572 (3.393)			32	0.468	10.075[1]	1.689
(3) Nominal	26.321			−0.802 (2.679)	3.563 (3.216)	−0.635 (1.606)	−0.611 (0.931)	32	0.448	7.293	1.691
(4) Real	22.304	−0.459 (18.121)[1]						32	0.356	18.121[1]	1.329
(5) Real	25.553		−0.309 (0.662)	−1.241 (14.437)[1]	4.410 (5.244)			32	0.463	9.894[1]	1.700
(6) Real	25.451			−1.248 (10.958)[1]	4.422 (4.940)	−0.325 (0.366)	−0.267 (0.053)	32	0.443	7.157	1.707

Source: See Table 1.
[1]Significant at 1 percent—F-values in parentheses.

210

TABLE 3

REGRESSIONS FOR THE RATIOS OF TAXES T_{ST}, INDIRECT TAXES T_{IND}, DIRECT TAXES T_{DIR}, SOCIAL SECURITY CONTRIBUTIONS T_{SOC} AND SURPLUS/DEFICIT S/D

No.	Constant	T_{ST}	T_{IND}	T_{DIR}	T_{SOC}	S/D	N	R^2	F	DW
(1)	21.983	-0.469 (14.595)[1]					32	0.305	14.595[1]	1.466
(2)	-29.484		2.612 (15.603)[1]				32	0.320	15.603[1]	1.633
(3)	15.230			-0.929 (12.387)[1]			32	0.269	12.387[1]	1.436
(4)	13.879				-0.795 (13.675)[1]		32	0.290	13.675[1]	1.401
(5)	4.699					0.644 (28.549)[1]	32	0.471	28.549[1]	1.786
(6)	-20.117		2.126 (1.509)	-0.389 (0.403)	0.118 (0.025)		32	0.285	5.126[1]	1.615
(7)	7.788	-0.085 (0.261)				0.572 (9.418)[1]	32	0.457	14.054[1]	1.756
(8)	-3.006		0.599 (0.132)	-0.382 (0.483)	0.360 (0.287)	0.584 (7.820)[1]	32	0.425	6.734[1]	1.804

Source: See Table 1.
[1] Significant at 1 percent—F-values in parentheses.

211

TABLE 4

INCOME REPORTED TO THE FISCAL ADMINISTRATION AND
NATIONAL INCOME (DM BILL.)

Year	1961	1965	1968	1971	1974
(1) Income of employees reported to the fisc	129.0^1	189.6^1	216.1^1	340.7^1	470.6^1
	148.8^2	216.7^2	249.6^2	393.4^2	549.1^2
(2) National income of employees	163.4	235.2	271.9	408.3	560.7
(1) as a percentage of (2)	78.9^1	80.6^1	79.5^1	83.4^1	83.9^1
	91.1^2	92.1^2	91.8^2	96.4^2	97.9^2
(3) Other income reported to the fisc	63.3^1	79.1^1	89.3^1	117.0^1	136.4^1
	68.4^2	89.8^2	117.2^2	159.1^2	186.6^2
(4) Other national income	97.3	123.4	148.0	182.8	211.7
(3) as a percentage of (4)	65.1^1	64.1^1	60.3^1	64.0^1	64.4^1
	70.3^2	72.8^2	79.2^2	87.0^2	88.1^2
(5) Total income reported to the fisc	192.3^1	268.7^1	305.4^1	457.7^1	607.0^1
	219.1^2	306.5^2	366.8^2	552.5^2	735.7^2
(6) National income	260.7	358.6	419.9	591.1	772.4
(5) as a percentage of (6)	73.8^1	74.9^1	72.7^1	77.4^1	78.6^1
	84.0^2	85.5^2	87.4^2	93.5^2	95.2^2

Source: See Table 1; Statistisches Bundesamt: Fachserie 14, various issues; Bundesministerium der Finanzen: Subventionsberichte, various issues.

[1] Tax statistics.
[2] Adjusted income.

TABLE 5

CURRENCY, DEMAND DEPOSITS, M_1, AND M_2

Year	C^a	D^a	M^a	M_2^a	C/D^b	C/M_1^b	C/M_2^b
1930	6.38			25.85			0.247
1932	5.64			18.73			0.301
1936	6.96			21.63			0.322
1938	10.40			28.64			0.363
1940	16.77			48.87			0.343
1948	6.39	6.87	13.26	14.41	0.930	0.482	0.443
1949	7.46	8.86	16.32	18.46	0.842	0.457	0.404
1950	8.11	9.96	18.06	22.54	0.814	0.449	0.360
1951	9.31	11.65	20.96	27.31	0.799	0.444	0.341
1952	10.81	12.32	23.13	31.93	0.877	0.467	0.339
1953	11.96	13.24	25.20	36.47	0.903	0.475	0.328
1954	12.75	15.70	28.45	39.38	0.812	0.448	0.324
1955	14.04	17.44	31.48	42.68	0.805	0.446	0.329
1956	14.88	19.01	33.89	47.65	0.783	0.439	0.312
1957	16.46	21.35	37.81	54.94	0.771	0.435	0.300
1958	17.94	24.64	42.58	60.52	0.728	0.421	0.296
1959	19.34	28.26	47.61	67.58	0.684	0.406	0.286
1960	20.83	30.25	51.08	72.70	0.689	0.408	0.287
1961	23.20	35.52	58.71	82.18	0.653	0.395	0.282
1962	24.25	39.03	63.28	88.46	0.621	0.383	0.274
1963	25.51	42.26	67.77	94.52	0.604	0.376	0.270
1964	27.89	45.16	73.05	100.82	0.618	0.382	0.277
1965	29.65	48.87	78.53	106.92	0.607	0.378	0.277
1966	30.88	48.74	79.62	113.39	0.634	0.388	0.272
1967	31.51	56.41	87.92	127.57	0.559	0.358	0.247
1968	32.59	60.88	93.47	142.33	0.535	0.349	0.229
1969	34.69	64.74	99.43	156.88	0.536	0.349	0.221
1970	36.89	71.33	108.22	173.38	0.517	0.341	0.213
1971	40.29	81.23	121.52	198.60	0.496	0.332	0.203
1972	45.77	93.53	139.30	232.33	0.489	0.329	0.197
1973	47.43	95.43	142.86	265.86	0.497	0.332	0.178
1974	51.52	106.91	158.43	279.60	0.482	0.325	0.184
1975	56.48	123.42	179.90	279.32	0.458	0.314	0.202
1976	60.57	126.28	186.85	298.18	0.480	0.324	0.203
1977	67.51	140.57	208.08	331.81	0.480	0.324	0.203
1978	76.20	161.71	237.91	375.41	0.471	0.320	0.203
1979	79.88	167.99	247.87	406.49	0.476	0.322	0.197
1980	83.96	173.39	257.35	440.54	0.484	0.326	0.191

Source: Calculated from Deutsche Bundesbank.
[a] In DM Bill.
[b] In percent.

213

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214

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Chapter 2:

Shadow Economy

2.1.

Shadow Economy, Laffer Curve and Illicit Cash in Simple Macroeconomic Models

(10th Anniversary Edition of the Greek Journal of Political Economy, Athens 1990, pp 118 – 157, in Greek Language)

2.2.

Size of the Public Sector, Economic Growth and the Informal Economy - Development Trends in the Federal Republic of Germany

(The Review of Income and Wealth, New Haven/Conn., Series 28 (1982), pp 191 – 215)

2.3.

Taxes, Tax Systems and Economic Growth

(Herbert Giersch (Ed): Towards an Explanation of Economic Growth, Tübingen 1981, pp 313 – 347)

Hans-Georg Petersen

Taxes, Tax Systems and Economic Growth

"The tax-state should not demand so much from people that they will lose the financial interest in production or even stop giving their best energy to it" [Schumpeter, 1918, p. 26].

"In Great Britain after the war I should guess that your figure of 25 per cent as the maximum tolerable proportion of taxation may be exceedingly near to the truth" [Keynes in a personal letter to Colin Clark. See Clark, 1970, p. 21].

I. Taxation, State Activity, and Economic Growth

The influence of taxation on economic growth has been discussed as long as the "tax-state" has been in existence. Since the strong decline of the growth rates in many countries in the mid-seventies this discussion has been intensified. The growth of the public sector is often named as one important growth-retarding factor. The growth of the public sector is expressed on the revenue side of the budget by an increase in the average tax rate[1]. Many people believe that the average tax rate has reached or already passed the tax burden limit. Especially in the Anglo-American countries, in which direct taxation in the form of income taxes traditionally plays a dominant role, the belief is widespread that the slowdown of growth rates is substantially or even exclusively due to the increase in the average tax rate and the simultaneously growing public sector[2].

Taxation has at least two effects on economic growth: on the one hand, it reduces available individual income, on the other hand, it influences growth via tax-financed public expenditures. When the public sector supplies more goods the share of goods and services with a low degree

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[1] If not otherwise noted the macro-economic average tax rate is defined in the following as the relation of total taxation (including social security contributions) to gross national product (GNP) or gross domestic product (GDP).

[2] See, e.g., Buchanan and Wagner [1977], Brunner [1978], Beenstock [1979].

of publicness grows larger: state activities extend to merit and private goods. Declining efficiency of tax-financed public expenditures and partial excess supply in public goods and services connected with growing disincentives of taxation permit the supposition that there is a relationship similar to a production function (law of decreasing returns) between the average tax rate and gross national product. Then, at least in theory, an optimal average tax rate (as well as an optimal share of the public sector) exists.

Many attempts have been made to evaluate the limits of taxation by analysing the effects of taxation on the supply of effort. However, the discussion of the micro-effects of taxation on the supply of labour (incentives to work) as well as on capital formation (incentives to save and to invest) did not lead to unequivocal results[1]. Whether income effects or substitution effects dominate remains an unsolved problem.

Recently some attempts have been made to shed light on the relation between taxation and growth using simple macro-data and regression analysis. In particular the "Laffer Curve"[2] which expresses the relation between tax revenue, average tax rate and GDP/GNP, is gaining more and more popularity. Not only the level of the average tax rate but also the tax structure (proportion of direct and indirect taxation) might have influence on economic growth. Beyond this the structure of direct taxation is under discussion, too. Therefore, in this paper the attempt will be made to survey these recent contributions on taxation and growth. The following three questions will be discussed:

(1) What relations exist between the average tax rate and economic growth? Is a limit of tax burden calculable and, if calculable, has it already been reached or even passed?

(2) What relations exist between the tax structure and economic growth? Does an increasing share of direct taxation retard economic growth?

(3) Would a change in the method of direct taxation - especially a shift from income taxes to expenditure taxes - remove potential growth-retarding factors?

The first two questions will be analysed with time-series and cross-section data, using highly aggregated variables of national accounts

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[1] This discussion will not be taken up in this paper; see, e.g., Koch [forthcoming] and Petersen [forthcoming (a)] and the large amount of literature on "optimal taxation."

[2] So called by Wanniski [1978b, p. 97].

statistics or national tax statistics[1]. Only the macro-economic effects are analysed.

For 23 OECD member countries tax statistics identically classified for all countries are available only for the period from 1965 to 1977[2]. In the case of Germany, where national statistics were used, the period under investigation is 1951-1982[3].

We are fully aware of the limits of such simplifying analyses. The data as well as the methods used are imperfect and the interpretations of the results are rather speculative and give no evidence for causal relationships. But actually there are not many alternatives and we think that at least some interesting trends could be found. It will be demonstrated again that one needs for concrete policy conclusions many more insights into tax systems than are given by this rough data. For the discussion of the third question - the shift from income to expenditure taxation - no data are available. Therefore, some theoretical reflections in the context of recent international discussions will be made.

II. Average Tax Rate and Economic Growth

The macro-economic analysis aggregates all effects of taxation on incentives to work, to save and to invest. It is assumed that the substitution effect and the income effect of taxation depend on the attained level of the gross national/domestic product and of the average tax rate. At a relatively low level of income (per capita) and a low average tax rate it is likely that the income effect is larger than the substitution effect. With increasing income (per capita) and an increasing average tax rate the substitution effect becomes more and more important and finally dominates the income effect [Beenstock, 1979, p. 10].

In testing this hypothesis, Beenstock and Gosling [1979] formulate a simple neoclassical model, from which they derive a production func-

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[1] It is obvious that such variables are only of limited capacity for interpretation, especially in international comparisons; see Littmann and Krüger [1975], Wissenschaftlicher Beirat [1976] and Hedtkamp [1977].

[2] OECD [1979]. - See the OECD list of taxes in Table A1 in the Appendix.

[3] The national accounts statistics have been extrapolated using data from public program planning and estimates of tax revenue.

tion, within which, besides a time trend (for such exogenous variables as population growth, technology, etc.), only the macro-economic average tax rate appears as determinant. The first derivative of the production function is "likely to be negative, since as the respective tax rates are raised economic incentives to hold capital and to supply labour are eroded" [Beenstock and Gosling, 1979, p. 6] . Neglecting the time trend the production function has the form:

(1) $Y = b - c T$

where Y indicates the gross national product and T the average tax rate [Beenstock, 1979, p. 11]. With this formula it is supposed that, from a certain average tax rate on, the "substitution effect dominates the income effect so that the supply of effort falls" [Beenstock and Gosling, 1979, p. 6]. The tax revenue REV follows from the multiplication of the national product Y and the average tax rate T:

(2) $REV = a + b T - c T^2$

where a indicates the autonomous tax receipts. This parabolic function between tax revenue and average tax rate has been called the "Laffer Curve"[1] [Wanniski, 1978b, p. 97]. If national data of the national accounts statistics for Germany are used (Table A2), the corresponding regression equations yield the results:

(3) $REV = 2,162,156.4 - 158,464.9 T + 2,903.7 T^2$
                              (7.336)   (13.234)

      $F = 330.62 \qquad \overline{R}^2 = 0.955 \quad DW = 0.71 \quad N = 32$

(4) $Y = - 3,888,919.2 + 126,689.4 T$

      $F = 10,484.95 \quad \overline{R}^2 = 0.997 \quad DW = 0.69 \quad N = 32$

F-test values are given in parentheses under the relevant coefficients, $\overline{R}^2$ is the adjusted R squared, DW the Durbin-Watson test and N the number of observations. The coefficients are significant at the 1 per

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[1] The basic idea behind this "law" has been known for a long time; Hume and Smith already knew of it and in Germany it was called the "Swiftsches Steuereinmaleins": As the tax burden increases, tax avoidance and tax evasion lead to an erosion of the taxable base so that tax revenues decline [Lotz, 1916, p. 352].

cent level, but the DW tests point to serial correlation. Moreover, the signs do not correspond to the equations (1) and (2): in the case of Germany there is a positive correlation between gross national product and average tax rate, and a "Laffer Curve" cannot be observed.

The results differ from those of Beenstock and Gosling [1979, p. 11], who, in the case of the United Kingdom for the period 1946-1977, take both equations to be verified. In order to get more evidence both hypotheses are tested in the following with times-series analyses for 23 OECD member countries[1] and additionally with four cross-section analyses for the same countries.

As to the correlation between the gross domestic product and the average tax rate for every OECD member country, the signs are in contradiction to equation (1): no negative correlations can be found (Table A4)[2]. It may be mentioned without going into detail that the estimations for equation (2) yield signs which correspond to the "Laffer Curve" in only 6 of the 23 OECD member countries. If the maximum is calculated, plausible values result in only four countries: for Denmark a maximum average tax rate of around 83 per cent, for Luxembourg 51 per cent, for Switzerland 36 per cent, and for the United Kingdom 45 per cent[3]. However, with regard to the F-test and the DW test, only in the case of Luxembourg does a statistically acceptable result exist.

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[1] Thirteen (N = 13) is the lowest number of observations for a statistically reliable interpretation.

[2] Table A3 contains the mean of the average tax rates T, marginal tax rates MT, and elasticities of tax revenue EL for the period 1965-1977 and their standard deviations. The rank numbers show the order of the countries starting with the highest mean value. The standard deviation of the marginal tax rate is higher than the standard deviation of the average tax rate because the non-eliminated changes in tax law have stronger effects on the marginal than on the average tax rate. The very high values of the standard deviation for Luxembourg and Switzerland result from the fact that for one or two years an absolutely declining GDP was accompanied by increasing tax revenues (likely caused by a time-lag between the rise in the liability to tax and receipt of tax revenues: assessment-lag). Therefore, following the above definition, the marginal tax rates became negative. This also explains the relatively low marginal tax rate and elasticity of tax revenue for Switzerland.

[3] Beenstock and Gosling [1979, p. 11] calculate a maximum of about 62 per cent for the United Kingdom.

The cross-section analyses lead to similar results (Table A5). The correlation between GDP per capita (in US $)[1] and the average tax rate is positive; the non-linear regression equations for the relation between taxes per capita (in US $) and average tax rate yield signs for 1965 and 1970 which correspond to the "Laffer Curve[2]," but the coefficients are not significant. For 1977 - the year with the highest level of the average tax rates in nearly all OECD member countries - and for the mean of the period 1965-1977 the signs do not correspond to the "Laffer Curve."

The formulation of the "Laffer Curve" as a parabolic relationship between tax revenue and average tax rate seems to be too simple, because this parabolic relationship implies that a strong negative correlation exists between GNP/GDP and average tax rate. In other words - if a relationship between GNP/GDP and average tax rate similar to a production function is accepted - we are already on the falling branch of the production function because of declining efficiency of tax-financed public expenditures and the overwhelming substitution effects of taxation. But, in general, these assumptions seem to be too restrictive.

Another simple attempt has been made to shed light on the relation between taxation and economic growth, in which it is not presumed that we are already on the falling branch of the production function. If a negative correlation between GDP and average tax rate cannot be observed, it is still possible that the dominant substitution effect could retard economic growth, here measured as the annual growth rates of the real gross national/domestic product $\ddot{Y}_R$. It is obvious that in the context of measuring substitution effects marginal tax rates would be more appropriate. But up to now macro-economic marginal tax rates have not been developed and those estimated above (see Table A3) have too many shortcomings, thus regressions with them only led to a worsening of the results compared to the average tax rates. Equation (1) then becomes [3]:

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[1] GDP per capita and taxes per capita have been used to take care of the different stages of development in the OECD member countries.

[2] A plausible maximum value for the average tax rate results with 73.4 per cent only for 1965.

[3] In regression analyses there is no evidence for a negative correlation between the growth rate of gross national/domestic product and the growth rate of the average tax rate, because growth-retarding effects might depend not only on the increase in the average tax rate but also on the level of the average tax rate which has already been reached.

(5) $\dot{Y}_R = b - cT$

In the case of Germany, using national accounts data for the whole sample period (1951-1982) yields:

(6) $\dot{Y}_R = 21.983 - 0.469\ T$

$$F = 14.60 \quad \bar{R}^2 = 0.305 \quad DW = 1.47 \quad N = 32$$

where the coefficient is significant at the 1 per cent level, and the DW test rejects serial correlation. The adjusted R squared shows that a weak negative correlation exists between growth rate and average tax rate in Germany over the longer sample period. The results for all OECD member countries are given in Table 1. Only in the cases of Australia, Japan, Sweden, and Switzerland are significant signs and more or less weak negative correlations given[1]. As regards the cross-section analysis (Table 1), for every chosen year there is a negative sign, but a significant and weak negative correlation is confirmed only for 1977 and the mean of the period 1965-1977[2].

Time-series[3] and cross-section results lead to an overwhelming rejection of the negative relationship between the GNP/GDP and the average tax rate as stated in equation (1); thus it is not surprising that in our estimations the "Laffer Curve" as stated in equation (2) could not be verified. Especially the wide divergence of the statistical measures gives rise to the supposition that the resulting "Laffer Curves" in the case of Luxembourg as well as in the case of the Beenstock estimation for the United Kingdom are accidental rather than the result of a strong "economic law." However, at least some evidence is given for a negative correlation between the growth rate of real GNP/GDP and the average tax rate as stated in equation (5). But for this development we have some conventional explanations: The yield elasticity of the tax systems during the last years and the high

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[1] The poor results for Germany in Table 1 compared with those in equation (6) can be explained by differences in the definitions of national statistics and the OECD statistics. Moreover, there was in the latter a sample of only thirteen observations.

[2] Regressions with the growth rates of real GDP per capita lead to corresponding results and cross-section analyses with GDP per capita as catch-all variable lead to a worsening of the results.

[3] We also made some estimations with moving averages and different lag structures but they did not yield better results.

Table 1 - Results of the Correlation between Average Tax Rate (T) and Real Growth for the OECD Member Countries

Time-Series Analysis, 1965-1977					
Country	Constant	T	$\bar{R}^2$	F	DW
Australia	18.82	-0.54	0.242	4.84*	2.26
Austria	16.44	-0.32	-0.036	0.58	2.19
Belgium	13.73	-0.26	0.075	1.98	2.14
Canada	17.69	-0.41	0.153	3.17	2.11
Denmark	9.39	-0.15	-0.060	0.32	2.29
Finland	23.11	-0.54	0.232	4.63	1.53
France	20.84	-0.45	0.110	2.48	2.10
Germany	14.50	-0.32	-0.026	0.70	1.81
Greece	14.37	-0.34	-0.049	0.44	1.88
Ireland	2.12	0.05	-0.084	0.07	1.41
Italy	14.00	-0.32	0.010	1.12	2.27
Japan	38.02	-1.50	0.352	7.53*	1.67
Luxembourg	14.61	-0.32	0.105	2.41	1.98
Netherlands	15.05	-0.26	0.090	2.19	2.31
New Zealand	15.69	-0.45	0.155	3.20	1.01
Norway	2.30	0.05	-0.050	0.43	2.22
Portugal	12.28	-0.29	-0.051	0.42	2.13
Spain	15.73	-0.55	0.129	2.78	1.66
Sweden	10.94	-0.28	0.346	7.35*	2.01
Switzerland	15.99	-0.54	0.259	5.19*	1.63
Turkey	6.22	0.02	-0.090	0.01	2.64
United Kingdom	20.22	-0.51	0.142	2.99	2.28
United States	33.38	-1.03	0.184	3.70	1.58
Cross-Section Analysis					
Year	Constant	T	$\bar{R}^2$	F	DW
1965	7.83	-0.11	0.107	3.64	1.65
1970	9.98	-0.15	0.093	3.24	2.10
1977	6.96	-0.13	0.200	6.52*	2.45
Mean for 1965-1977	7.95	-0.12	0.319	11.32*	2.58

*Significant at the 5 per cent level.

Source: Calculated from OECD [1979].

growth rates of income have caused the strong increase in the average tax rates in spite of some autonomous tax reductions. If the average tax rate reaches a certain level, which - as the discussion of the "Laffer Curve" has shown - is hardly definable, then disincentives are possible, which can retard growth. Especially in a process of secular inflation accompanied by real economic growth, the phenomenon of "fiscal drag" becomes probable [Neumark, 1979, p. 197].

The process of nominal and real growth has - besides the effect of raising the average tax rate - some consequences for the tax structure. Changes in the tax structure have been caused by the different elasticities of tax yield for individual taxes. Therefore, growth-retarding effects might occur in the case of relatively constant or even in the case of relatively low average tax rates (as in Australia, Japan, and Switzerland; see Table 1 and the corresponding average tax rates in Table A3). Then the individual taxes differ not only as to their yield elasticity, but also relative to the effects which they have on the incentives of individual taxpayers - a topic, which will be discussed in the next section.

III. Direct Taxation, Indirect Taxation and Economic Growth

Not only has the average direct tax rate (defined as the ratio of direct taxes to gross domestic product) increased in nearly all OECD member countries but the ratio of direct taxes to total taxation has also considerably increased in some of them. The development of the average indirect tax rate was not uniform: in some countries it declined; in others it remained constant or increased only a little. But the ratio of indirect taxation to total taxation declined with no exception[1].

In order to get some impression of the structure in taxation in the individual OECD member countries, we have represented in Table A6 the mean and standard deviation for the growth rate of real GDP/GNP, the mean direct and indirect tax rates, the ratio of direct and indirect taxes to total taxation, and their respective ranks for the period 1965-1977. Japan has the highest real growth rate, followed by the less developed OECD member countries Turkey, Greece, Portugal and Spain, which are in the "catch-up" phase. The United Kingdom is at the bottom.

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[1] For the classification see the OECD list of taxes in the Appendix (Table A1).

The structural change from indirect to direct taxation was mainly caused by income taxes[1], which in nearly all tax systems have the highest elasticity of tax yield. For the individual taxpayer direct taxes are immediately noticeable because income taxes directly reduce net income, whereas indirect taxes mostly reduce the real value of net income through higher prices of goods and services, so that they are less noticeable[2]. Consequently, even with a constant average tax rate an increasing awareness of the tax burden in the taxpayer's mind could be evoked, thus leading to intensified disincentives. If the change in the tax structure is accompanied by a strong increase in the total average tax rate, the disincentives are further strengthened.

In the following the question will be discussed whether there is some empirical evidence for the experience that an increasing share of direct taxes is accompanied by an increasing awareness of the tax burden, which leads to additional disincentive effects [Karl-Bräuer-Institut, 1979, p. 28].

The total average tax rate for Germany has been divided into the average rate for direct and indirect taxation (TDIR and TIND) and social insurance contributions (TSOC). Estimating the regression equation using national data for the national accounts statistics yields the results:

(7) $\dot{Y}_R$ = 15.230 - 0.929 TDIR

F = 12.39 $\bar{R}^2$ = 0.269   DW = 1.44   N = 32

(8) $\dot{Y}_R$ = - 29.484 + 2.612 TIND

F = 15.60 $\bar{R}^2$ = 0.320   DW = 1.63   N = 32

(9) $\dot{Y}_R$ = 13.879 - 0.795 TSOC

F = 12.39 $\bar{R}^2$ = 0.290   DW = 1.40   N = 32

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[1] But also by the social insurance contributions (here treated as direct taxes), where Messere [1978, p. 204] observed "the erosion, if not yet the complete collapse, of the insurance myth." In his paper many further details of the changes in the tax structures of the OECD member countries are represented.

The simple linear regression equations are all significant; the growth rate can be observed to have a weak negative correlation with the average direct tax rate (TDIR) as well as with the average rate for the social security contributions (TSOC), whereas there is a positive correlation between the average indirect tax rate (TIND) and the growth rate. Estimating a multiple regression equation over the whole sample period yields:

$$(10) \quad \dot{Y}_R = -20.117 - 0.389 \text{ TDIR} + 2.126 \text{ TIND} + 0.118 \text{ TSOC}$$
$$(0.40) \qquad\qquad (1.51) \qquad\qquad (0.03)$$

$$F = 5.13 \quad \bar{R}^2 = 0.285 \quad DW = 1.62 \quad N = 32$$

Only in the case of the average rate for the social security contributions does the sign change; however, all coefficients are, according to the F-values (in parentheses), not significant. Compared to the linear regression with the total average tax rate (see equation (6)), the adjusted R squared deteriorated. During the sample period, a negative correlation seems to exist between the average direct tax rate and the growth rate for Germany.

Time-series analyses have also been completed for the other OECD member countries (Table A7). There are almost only weak negative correlations between growth rates and average direct tax rates; for only five countries are the results statistically significant. In the countries with a relatively high adjusted R squared for the total average tax rate[1] the average direct tax rate also has a relatively high weight, according to this statistical measure. The results are less uniform with regard to indirect taxation: for Australia, Luxembourg, New Zealand and Sweden there are negative correlations with a relatively high $\bar{R}^2$ in spite of low shares of indirect taxes. On the other hand, there are statistically significant positive correlations for Japan, Spain and Switzerland, which have a rather low share of indirect taxes, but also for France, which has a high ratio of indirect taxes to total taxation (Table A6)[2].

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[1] Among them Japan, Switzerland and Australia, all countries with a relatively low total average tax rate.

[2] For checking the sign, multiple regressions have also been made (Table A8). For Denmark, France, Greece, Japan, Luxembourg, New Zealand, Spain, Sweden and Switzerland, breaking down the total average tax rate increases $\bar{R}^2$, in some cases quite substantially, but for other countries

Table 2 - Results of the Cross-Section Analysis between Taxation and Real Growth for OECD Member Countries

Direct Taxation and Real Growth					
Year	Constant	$TDIR/Y^a$	$\bar{R}^2$	F	DW
1965	7.02	-0.13	0.084	3.02	1.79
1970	9.95	-0.23	0.156	5.06*	2.22
1977	7.24	-0.19	0.334	12.02*	2.31
Mean for 1965-1977	7.93	-0.17	0.457	19.52*	2.51

Indirect Taxation and Real Growth					
Year	Constant	$TIND/Y^b$	$\bar{R}^2$	F	DW
1965	6.26	-0.14	0.007	1.15	1.75
1970	5.69	-0.03	-0.046	0.03	2.10
1977	2.33	0.01	-0.047	0.01	2.22
Mean for 1965-1977	4.75	-0.04	-0.037	0.23	2.55

Direct Taxation, Indirect Taxation and Real Growth						
Year	Constant	$TDIR/Y^a$	$TIND/Y^b$	$\bar{R}^2$	F	DW
1965	7.79	-0.12 (2.26)	-0.10 (0.53)	0.063	1.74	1.66
1970	9.75	-0.23 (4.81)*	0.02 (0.02)	0.115	2.42	2.23
1977	6.64	-0.20 (12.20)*	0.07 (0.48)	0.317	6.11*	2.13
Mean for 1965-1977	7.78	-0.18 (18.35)*	0.02 (0.09)	0.432	9.38*	2.47

^{a}TDIR/Y = ratio of direct taxes to GNP. - ^{b}TIND/Y = ratio of indirect taxes to GNP. - *Significant at the 5 per cent level. - F-values in parentheses.

Source: Calculated from OECD [1979].

In Table 2 the results of the cross-section analyses are given for the years 1965, 1970 and 1977. The negative correlation between the growth rates of real GNP/GDP and the average direct tax rate is verified. $\bar{R}^2$ increases from a low level between 1965 and 1970 and the F-test discloses significant results for 1970, 1977 and for the mean of the period 1965-1977. Contrary to this the regressions for the average indirect tax rate are not significant; in 1977 the sign changes, but there is no unequivocal correlation between growth and indirect taxation. The multiple regression equations for the cross-section data are represented in Table 2. As in the simple linear regressions there are negative signs for the average direct tax rates, but unlike the results of the simple regressions the average indirect tax rates already have a positive sign in 1970. We also calculated some rank correlations between the ranks of the mean growth rates and the ranks of the various mean tax rates (Table 3). Negative correlations are to be found for the total average tax rate T and the marginal tax rate MT, for average direct tax rate TDIR as well as for the ratio of direct taxation to total taxation TDIR/T.

Table 3 - Spearman's Rank Correlation Coefficients for the Ranks of Growth Rates and of Various Indicators of Taxation[d] for the OECD Member Countries

	T	MT	EL	TDIR/Y	TIND/Y	TDIR/T	TIND/T
R	-0.455	-0.462	-0.239	-0.637	0.021	-0.515	0.516
t-value	2.341*	2.387*	1.128	3.787**	0.096	2.753**	2.760**

[a]T = average tax rate; MT = marginal tax rate; EL = elasticity of revenue; TDIR/Y (TIND/Y) = ratio of direct (indirect) taxes to GNP; TDIR/T (TIND/T) = ratio of direct (indirect) taxes to total taxes.

* (**)Significant at the 5 (1) per cent level.

Source: Calculated from Tables A3 and A6.

this decreases $\bar{R}^2$ considerably (e.g., Australia, Canada, Finland, United Kingdom and the United States). The sign changes compared to the simple linear regressions for the average direct tax rates of Germany, Ireland, Luxembourg, and Turkey, and for the average indirect tax rates of Finland, the Netherlands, Norway and Portugal.

The results may be briefly summarised thus: there are no unequivocal correlations between the tax structure and the growth rate of real GNP/GDP. There are countries with a somewhat statistically significant negative correlation for direct taxes and positive correlation for indirect taxes (France, Japan and Switzerland); on the other hand, in the case of Sweden, there is a relatively high significant negative correlation for direct as well as indirect taxation. And in cases of relatively low total average tax rates but relatively high shares of direct taxes in total taxation, negative correlations between growth and average direct tax rates can be observed (Japan, Spain, and Switzerland).

The effects of changes in the tax structure on economic growth depend on the level of the total average tax rate, the existing tax structure and - last but not least - on the behaviour of the taxpayers in the different countries; i.e. on how strongly the taxpayers react to automatic and/or autonomous changes in the total average tax rate or in the tax structure[1].

Disregarding the level of total average tax rates, there are some countries in which a change in the tax structure from direct to indirect taxation could have reduced disincentive effects (e.g., France[2], Japan, and Switzerland). But there are also countries in which such a strategy makes no sense (especially Sweden). The so-called imperceptibility of indirect taxes is not independent of the level of the average tax rate and the tax structure. With a relatively low total average tax rate and a relatively high ratio of direct taxation to total taxation the imperceptibility of indirect taxation may be high; with an increasing total average tax rate and an increasing share of indirect taxation, imperceptibility decreases. At a high total average tax rate and a relatively high share of indirect taxes imperceptibility may disappear. Just as money illusion decreases with an increasing rate of inflation so may "indirect-tax illusion" decrease with a (sharply) increasing share of indirect taxes. Therefore, assuming a high total average tax rate shifting the tax burden from direct to indirect taxation will make no sense, because the taxpayers' reaction will stay unchanged: indirect-tax illusion is not further exploitable.

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[1] The reactions might be legal or illegal; the extent of illegal reactions is an expression of the tax morality of the taxpayers in the different countries.

[2] French taxpayers, for example, have traditionally high reservations about direct taxes (especially income taxes) which might be a consequence of the "inquisition fiscale" which is associated with income taxation; see, for example, Kolms [1977].

IV. Income Tax versus Expenditure Tax

The international discussion on the introduction of an expenditure tax was recently intensified by two Anglo-American contributions [Advisory Commission, 1974; Meade, 1978]. Meade proposed a total replacement of the income tax system with an expenditure tax system for the United Kingdom[1]. An expenditure tax is given, if the consumption expenditures are directly taxed with regard to the individual consumer's ability to pay.

In this paper, it is impossible to enter into all details of the discussion connected with the problems of shifting from an income tax to an expenditure tax [Zumstein, 1977]. Only the question stated above will be discussed, i.e., can a change of the direct tax structure - e.g., by replacing an income tax with an expenditure tax - remove potential growth-retarding effects?

The advocates of an expenditure tax call special attention to the assertion that in an income tax system, as a result of the disincentives, the objectives of equity and growth are in conflict with each other ("trade-off between equity and growth"), whereas "the progressive consumption tax appeared to offer the unique advantage of reconciling his [Kaldor's] concern for equity with a much-needed stimulus to economic growth in the situation of comparative stagnation which has characterised the British economy over the post-war period" [Head, 1979, p. 195]. It is conceded that an expenditure tax dampens the incentive to work (to save and to invest) less than an income tax [Peffekoven, 1979, p. 153]. But there are fears that an expenditure tax with a progressivity which corresponds to that of an existing income tax would contribute less to the objective of "vertical equity" because, in view of high marginal tax rates, the avoidance of consumption for the purpose of tax avoidance could be stimulated. "This objective assumes particular importance under a progressive consumption tax regime which would otherwise tend to exacerbate inequalities in wealth hold-

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[1] "In this century, the controversy has a curious twenty-year periodicity with Irving Fisher in the 30s, Kaldor in the 50s and the Meade Committee in the 70s; or perhaps it is not so curious, given the general propensity of economists to re-invent the wheel every time they get half a chance" [Prest, 1979, p. 245].

ings[1]." Beyond this (as in the Meade Report) the extra benefits of savings[2] are taken into consideration; besides the expenditure tax an extra wealth tax will become necessary. "The need for supplementary wealth taxes is strongly emphasized in the original discussions of Fisher and Kaldor[3]." The wealth tax shall be arranged - following the proposals of the Meade Commission - either as combined "progressive annual wealth and accession tax (PAWAT)" [Meade, 1978, p. 320] or as "AWT [annual wealth tax] with a high exemption and a rate structure rising progressively to high rates on the largest fortunes to encourage dispersal, supplemented by a LAWAT [linear annual wealth accession tax] at moderate rates to provide some degree of discrimination against inherited wealth" [Head, 1979, p. 221].

How stringent is the argument that an expenditure tax is much more "growth beneficial" than an income tax? As for the income tax, it was argued that with increasing marginal tax rates the substitution effect dominates the income effect, and therefore the supply of work (or more generally, of effort) will be reduced. Reducing the supply of work simultaneously leads to more non-taxed leisure, which can be used for recreation but also for licit (e.g., do-it-yourself) or even illicit work (in German called "Schwarzarbeit"). An income tax therefore in effect "taxes" the division of labour, which, as the result of technological progress, was one of the most important sources of growth in history. Hence it follows that the income tax retards economic growth by impairing further division of labour[4].

Expenditure taxation cannot be avoided by reducing the supply of labour. Does that permit the conclusion that an expenditure tax leaves the process of labour division untouched? Doubtlessly levying an expenditure tax on lower income brackets would force people to work

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[1] Head [1979, p. 199]. - The "Staatsbürgersteuer" ("citizen tax") proposed by Engels, Mitschke and Starkloff [1973] for Germany included, besides an expenditure tax, a unique wealth accession tax at the end of the taxpayer's life.

[2] Resulting from "the advantage of security, independence and influence which are associated with ownership of property" [Meade, 1978, p. 34].

[3] Head [1979, p. 217]. Because under an expenditure tax system enterprises stay vastly untaxed, without a supplementary wealth tax the concentration of wealth in this area will rise sharply.

[4] This retards growth especially if goods and services are completely substitutable by do-it-yourself activities, which are not recorded in the standard national accounts statistics. The relations between do-it-yourself activities and economic growth are, in spite of the growing importance of this "movement," to a large extent unexplored [Petersen, forthcoming (b)].

more. An income effect could result. But since the expenditure tax has to follow the ability-to-pay principle, such an effect would not materialise. Are substitution effects in the higher income brackets, which are confronted with a progressive expenditure tax, totally out of the question? The answer depends mainly on the degree of progression of an expenditure tax system; that is to say, on how sharply the slope of the progression changes with increasing consumption.

If the income and corporation taxes (in the United Kingdom the capital gains tax, too) are totally replaced with an expenditure tax, assuming equal revenue, the progression in relation to consumption must be more severe than in relation to income. In other words, an expenditure tax is bound to have higher marginal tax rates than an income tax[1]. Moreover, both taxes are equally noticeable because of similar procedures of tax collecting (assessment or deduction procedure).

If the consumption expenditures - especially for durable goods - are taxed with marginal rates of over 100 per cent, it is possible that the taxpayers will also reduce their supply of labour in order to produce some consumption goods in their additional leisure time by do-it-yourself methods, thus avoiding the expenditure tax. The direct exchange of goods and services (barter transactions) would become more lucrative under an expenditure tax scheme than under an income tax scheme. Besides that, tax evasion and illicit work would be kept alive. Where neighbourly aid becomes illicit work is, even under the existing income tax scheme, hard to determine. For very well-to-do people self-sufficiency would again become attractive. The expenditure tax could promote the present movements of "back to nature" and "back to barter."

It may be that the above explanations have revolved around the "old sport of comparing an impure income tax with a pure expenditure tax" [Prest, 1979, p. 246]. The effects of an expenditure tax are determined substantially by the concrete practical arrangements[2]. It has

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[1] In the British income tax system the maximum marginal tax rate on "earned income" was at 83 per cent as the Meade Report was published (on "investment income," 98 per cent; in 1979 the rates were reduced to 60 and 75 per cent, respectively). "Corresponding expenditure tax rates expressed on a tax exclusive basis would rise over 400 %" [Head, 1979, p. 207].

[2] Many critics of the expenditure tax consider the problems of the practical implementation insurmountable [Peffekoven, 1979, p. 155].

been shown to be indisputable that an expenditure tax as well can create disincentives, which would depend on the degree of progression and the level of taxation already reached. Whether the direct effects of an income tax on the supply of labour (effort) are stronger than the indirect effects of an expenditure tax with a corresponding progression cannot be answered, especially in view of the weak empirical results regarding the disincentive effects of income taxation [Goode, 1976, p. 52; Koch, forthcoming]. Perhaps the only additional effect of replacing the income tax with an expenditure tax would be the creation of "illicit consumption" ("Schwarzkonsum") going along with "illicit work" ("Schwarzarbeit").

Although disincentive effects under an expenditure tax scheme cannot be excluded, positive effects on economic growth could also be expected, because savings and investment remain, in principle, untaxed. Even supporters of the income tax agree that, under an expenditure tax, incentives and possibilities to save are more favourable [Goode, 1976, p. 42]. Now, if capital formation is "limited by the propensity to save rather than by the willingness to invest" [ibid., p. 75], positive effects on economic growth are likely; these effects are stronger the more positively the risk taking of investors (in lessening the risk aversion) is influenced by an expenditure tax. Even if such ideal presuppositions are to be met, Goode [1976, pp. 72, 325] expects (with reference to Denison) only low positive effects on economic growth: "Moreover, the contribution that additional saving and investment can make to the growth of an economy such as that of the United States may be less than is often supposed" [ibid., p. 74].

But what happens with the incentives to save and to invest if - as most of the supporters of the expenditure tax believe - besides the expenditure tax a supplementary wealth tax is considered to be necessary? In the Meade Report, as mentioned above, a supplementary progressive wealth tax system, which would also cover inheritances, has been proposed. An annual wealth and wealth accession tax system has to prevent an unwanted concentration in the distribution of wealth. It is really astonishing that the incentives which a wealth tax supplementary to an expenditure tax scheme could create have been neglected almost totally in the discussions up to now[1].

Whether an annual wealth tax or a unique wealth tax at the end of one's life is used, incentives to save and to invest arise, either distributed over the taxpayer's whole life or concentrated at the end of his life.

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[1] Only Prest [1979, p. 247 and p. 256, footnote 1] makes some brief hints.

The incentive effects also depend on the degree of progression of the wealth tax system, which must be high because of the concentration promoting effects of the expenditure tax[1]. Via the supplementary wealth tax system those disincentives appear again, which, supposedly or in fact, are to be removed by replacing the income tax with an expenditure tax. It is impossible to exclude the eventuality that under a combined expenditure and wealth tax scheme the disincentives (to work, save and invest) could be stronger than under a combined income and corporation tax scheme. "The taxation of income seems likely to be less favorable to private saving and investment propensities than the taxation of consumption but more favorable than the taxation of personal wealth" [Goode, 1976, p. 56]. Whereas both the income tax and the expenditure tax could have disincentives for the labour supply, the wealth tax could especially cause disincentives for savings and investments. The Meade Commission has shut its eyes completely to this argumentation[2].

Replacing the income tax with an expenditure tax, one cannot escape the "trade-off between vertical equity and growth." A tax system which does not affect allocation is in reality impossible [Schumpeter, 1918, p. 26]. A tax based consistently on the ability-to-pay principle is just as impossible. The ability-to-pay principle conflicts with the objective of preventing growth retardation. In view of this conflict between objectives, one must decide how far the ability-to-pay principle of taxation can be neglected in favour of growth [Haller, 1970, p. 25]. To what extent the ability-to-pay principle is aspired to and how much growth is wished, reduces to a value judgement that must be decided politically. Economists can only show that the realization of the ability-to-pay principle and of vertical equity is not costless but how much it may cost is still an open question.

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[1] The degree of progression of the supplementary wealth tax depends on the degree of progression of the corresponding expenditure tax.

[2] "One gets the feeling that some particular solutions seemed so obviously desirable to them that the obstacles to their achievement, however great, had to be regarded as challenges to their ingenuity rather than warnings to change course" [Prest, 1979, p. 260].

V. Concluding Remarks and Some Implications for Tax Policy

1. This first attempt to shed light on the relation between taxation and growth using regression analysis is not satisfying. Even if better data were available these methods would still only allow restrictive interpretations. Perhaps using simultaneous equation models would lead to better results, but because of limited time this remains for further investigations. Since this subject is rather complex we are not very optimistic that one can get better results very soon. This will happen only if we are able to integrate - besides other economic variables - more factors representing different institutional regulations and political, sociological as well as psychological attitudes within the different countries.

Nevertheless some interesting trends have been found which are partly in accordance with conventional arguments:

(1) In our investigations there is no empirical evidence sufficient for proving that a negative correlation exists between taxation and gross national product. Therefore it is not surprising that a relationship similar to the "Laffer Curve" could be found only for Luxembourg, but the resulting curve is accidental rather than the result of an "economic law."

(2) There is some empirical evidence for the hypothesis that, as the result of the dominating substitution effect, a negative correlation exists between the rate of real growth and the total average tax rate[1]. A "fiscal drag" of the tax system on economic growth seems possible. However, no uniform trends of development in all OECD member countries could be observed.

(3) The fiscal drag was caused especially by direct taxes. The fact that indirect taxation is less noticeable for the taxpayers than direct taxation likely leads to less growth-retarding pressure. But with increasing indirect taxation there would be some retardation.

2. Fiscal drag depends mainly on the size of the marginal tax rates. Marginal tax rates are a signal for taxpayers to change their behaviour. If, as in the example of the United Kingdom before the Thatcher administration, the investment income is taxed by marginal rates of up to 98 per cent (a maximum marginal rate of 83 per cent on taxable (earned) income and an investment income surcharge (on unearned in-

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[1] If we could define an appropriate total marginal tax rate the correlation might be much closer.

come) of up to 15 per cent)[1], it is obvious that such marginal rates will not become effective. Therefore they are not reflected in the ex post macro-economic tax rates we used above. "The pressure to avoid tax becomes so strong that virtually any avoidance scheme becomes worth while, and no aspect of the activity in question is of any importance other than its tax implications" [Kay, King, 1978, p. 51]. If at the same time a capital gains tax exists which taxes capital gains at only 30 per cent, those forms of investment become especially attractive which promise only a small interest yield (which could be taxed for instance at the maximum marginal tax rate) but high capital gains: "If investment in shares, in bank deposits, or in investment property is very heavily taxed, it is not very surprising that many rich people buy large houses, or several houses, valuable pictures and furniture, cars, hobby farms, and so on[2]."

3. The above explanations have made it clear that a judgement on the effects of a tax system on economic growth requires deep insights into the individual tax systems. The assertion that one must live in a country if one is to become acquainted with its tax system is doubtlessly correct. Growth-retarding forces are much more involved in the innumerable and very complicated details of tax laws, the effects of which were only briefly indicated in the analysis above. In Germany, for instance, the investment in shares is discriminated against, because dividends are taxed at the source by way of the corporation tax and the dividend tax, whereas interest payments on mortgages, fixed-interest bearing bonds and other monetary investments are not taxed at the source. Here we have a "publicly accepted toleration of tax evasion" on interest payments with far-reaching consequences for allocation.

4. The replacement of the income tax system with an expenditure tax system seems to be less promising if one takes into account that growth is especially affected by the details of complex tax laws. The income tax has come through a long process of development, but that does not mean "an old tax is a good tax" and that every reform is useless. In this long process, many inconsistencies and loopholes have entered the income tax laws, not in the least because of strong pressure groups. One must agree with Head [1979, p. 197] who states:

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[1] The abolition of the investment income surcharge is under discussion.

[2] Kay, King [1978, p. 55]. And this holds even though the United Kingdom has such favourable depreciation allowances that - according to an inquiry of the Institut der Deutschen Wirtschaft [Fuest, 1979] - it could, compared with Germany, be called a paradise for entrepreneurs.

"In any realistic democratic political setting the optimal tax alternative would soon be reduced to a shambles as a result of unjustifiable concessions to special interest groups." Under an expenditure tax scheme such developments cannot be excluded either, so that "one would have to replace the expenditure tax by the income tax for exactly the same reasons after, say, another twenty years!" [Prest, 1979, p. 246]. Peffekoven [1979, p. 154] even asserts that every one of the supposed positive effects of an expenditure tax could also be reached with corresponding arrangements in the income tax.

5. If a replacement of the income tax with an expenditure tax is senseless under the aspect of growth, what alternatives exist for tax policy to enhance growth? It is urgent to reduce the marginal rates of direct taxation. Doubtless, the Meade Commission must be agreed with that extremely high marginal tax rates are very problematic because they contribute little to vertical equity, but may well have significant disincentive effects on the supply of effort [Meade, 1978, p. 308]. The redistribution effects of the income tax system have been lessened in that today people with relatively low incomes must pay income taxes and in that these lower income brackets are sharply graduated in nearly all OECD member countries, whereas the disincentive effects have been increased[1].

6. The reduction of marginal tax rates in the case of direct taxation in some OECD member countries could be possible through a slight shift from direct to indirect taxation, if some indirect-tax illusion still exists, but such shifting is also limited by the objective of vertical equity. On the other hand, if a limitation of state activity is desired [see, e.g., Buchanan, Wagner, 1977], the administration should use direct taxation because here the resistance to taxation is strongest. Also in this case a conflict between objectives is possible: reducing direct taxation and increasing indirect taxation could perhaps stimulate economic growth, but could also stimulate further increases in public expenditures as long as indirect-tax illusion exists, which certainly has feedback effects on economic growth.

7. Certainly more important than a shift from direct to indirect taxation are reforms within the direct tax systems. The privileges of certain investments, especially in land, houses, etc., have considerable allocative consequences in many OECD member countries, not to men-

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[1] The initial marginal rate (including social insurance contributions) was 39 per cent in 1975 in Germany, 39.75 per cent in the United Kingdom [Kay, King, 1978, p. 21].

tion the redistributive consequences. Not only inflation but also tax laws led to the result that for many years investments in "Betongold" [Giersch, 1973] and similar property were higher than investments in productive assets. These "excess burdens" [Musgrave, 1959, p. 140] for productive assets, which are very impressive in the British example mentioned above, have to be avoided. Therefore it is necessary to remove concessions made to individual pressure groups and to close existing loopholes. This could be achieved by a strategy of widening the income tax base; here one has only to mention the numerous articles on a "comprehensive tax base." Also, harmonising the tax and transfer system by introducing a social concept into the income taxation, as it already exists in some OECD member countries, can lead to a widening of the tax base, avoid the cumulation of different kinds of transfer payments, and lead to a stronger realisation of the principle of vertical equity. A comprehensive tax base gives financial scope for reducing tax progressivity and especially, for reducing the disincentive effects in the lower and middle income brackets.

8. An everlasting limit of taxation does not exist; which average tax rate can be considered tolerable depends on the attitude of taxpayers and, as part of this attitude, on the degree of "fiscal illusion." Attitudes change in the course of time. A tax with no influence on economic growth does not exist, an insight which is as old as the "Steuerstaat" (Tax State) itself [Schumpeter, 1918]. The trade-off between equity and growth will remain, but with a finely tuned tax and transfer system the trade-off could be reduced. The extent to which these objectives should be realised will have to be decided by democratically elected politicians and not by economists.

Table A1 - The OECD List of Taxes

Direct Taxes

1000 Taxes on Income, Profits and Capital Gains

    1100 Individual taxes on income, profits and capital gains
    1200 Corporate taxes on profits and capital gains
    1300 Unallocable as 1100 and 1200

2000 Social Security Contributions

    2100 Employees
    2200 Employers
    2300 Self-employed or non-employed

3000 Employers' Payroll or Manpower Taxes

4000 Taxes on Property

    4100 Recurrent taxes on immovable property
    4200 Recurrent taxes on net wealth
    4300 Estate, inheritance and gift taxes
    4400 Taxes on financial and capital transactions
    4500 Non-recurrent taxes

Indirect Taxes

5000 Taxes on Goods and Services

    5100 Taxes on production, sale, transfer, leasing and delivery of goods and rendering of services
    5200 Taxes on use of, or permission to use, goods or to perform activities in connection with specified goods

6000 Other Taxes

Source: OECD [1979].

Table A2 - Average Tax Rate (T), Marginal Tax Rate (MT) and Elasticity of Tax Revenue (EL) for Germany, 1951-1982

Year	Y (million DM)	REV (million DM)	T (per cent)	MT (per cent)	EL
1951	120,000	36,980	30.82	36.16	1.17
1952	137,000	44,010	32.12	41.35	1.29
1953	147,700	48,390	32.76	40.93	1.25
1954	158,600	51,210	32.29	25.87	0.80
1955	181,400	56,910	31.37	25.00	0.80
1956	200,500	63,170	31.51	32.77	1.04
1957	218,500	70,080	32.07	38.39	1.20
1958	234,300	75,300	32.14	33.04	1.03
1959	254,900	82,910	32.53	36.94	1.14
1960	303,000	100,070	33.03	37.38	1.13
1961	331,400	113,330	34.20	46.69	1.37
1962	360,500	124,760	34.61	39.28	1.13
1963	382,100	132,950	34.79	37.92	1.09
1964	419,600	144,490	34.44	30.77	0.89
1965	458,200	154,910	33.81	26.99	0.80
1966	487,400	167,070	34.28	41.64	1.21
1967	493,700	170,950	34.63	61.59	1.78
1968	535,200	183,730	34.33	30.80	0.90
1969	597,700	217,110	36.32	53.41	1.47
1970	679,000	241,550	35.57	30.06	0.85
1971	756,000	274,870	36.36	43.27	1.19
1972	827,200	305,670	36.95	43.26	1.17
1973	920,100	361,180	39.25	59.75	1.52
1974	986,900	391,480	39.67	45.36	1.14
1975	1,032,900	404,530	39.16	28.37	0.72
1976	1,127,900	455,190	40.36	53.33	1.32
1977	1,198,700	499,430	41.66	62.49	1.50
1978	1,282,600	533,080	41.56	40.11	0.97
1979	1,381,400	567,240	41.06	34.57	0.84
1980	1,478,100	605,850	40.99	39.93	0.97
1981	1,581,500	653,040	41.29	45.64	1.11
1982	1,692,200	708,250	41.85	49.87	1.19

Source: 1951-1978 calculated from Statistisches Bundesamt, various issues. - Figures for 1979-1982 from own estimates.

Table A3 - The Mean of the Average Tax Rate (T), the Marginal Tax Rate (MT) and the Elasticity of Revenue (EL), and their Standard Deviations for the OECD Member Countries, 1965-1977

Country	Mean for T	Std. dev.	Rank no.	Mean for MT	Std. dev.	Rank no.	Mean for EL	Std. dev.	Rank no.
Australia	26.71	2.12	17	29.77	6.91	17	1.11	0.24	18
Austria	36.90	1.55	5	40.56	5.23	10	1.09	0.13	20
Belgium	36.55	3.63	7	47.72	9.97	5	1.29	0.25	2
Canada	30.92	2.30	14	36.35	10.74	14	1.17	0.36	16
Denmark	38.84	4.77	4	49.00	20.36	4	1.25	0.52	6
Finland	35.08	3.42	9	43.53	13.22	7	1.22	0.32	9
France	36.23	1.63	8	39.02	6.65	12	1.07	0.15	22
Germany	34.30	2.16	11	40.58	11.48	9	1.17	0.30	15
Greece	24.07	1.98	19	29.32	7.51	18	1.20	0.30	11
Ireland	31.11	2.80	12	39.05	11.56	11	1.25	0.42	5
Italy	31.08	2.76	13	35.63	10.51	15	1.13	0.27	17
Japan	19.98	1.91	22	21.72	7.88	22	1.07	0.35	21
Luxembourg	36.59	6.38	6	44.49	40.19	6	1.23	0.99	8
Netherlands	41.42	3.63	2	49.86	4.72	3	1.19	0.12	12
New Zealand	28.72	3.00	16	36.79	16.96	13	1.25	0.49	4
Norway	41.29	4.71	3	53.40	9.55	2	1.28	0.24	3
Portugal	22.39	2.72	20	28.01	9.50	19	1.23	0.36	7
Spain	18.56	1.92	23	23.20	13.13	21	1.21	0.66	10
Sweden	42.56	5.29	1	59.03	16.56	1	1.36	0.30	1
Switzerland	25.18	3.71	18	14.67	110.86	23	0.66	3.74	23
Turkey	20.22	2.93	21	24.17	8.20	20	1.17	0.35	14
United Kingdom	35.01	2.16	10	42.12	16.44	8	1.19	0.46	13
United States	29.02	1.35	15	32.11	13.18	16	1.10	0.44	19

Source: Calculated from OECD [1979].

Table A4 - Results for the Correlation between Average Tax Rate (T) and GDP and between Average Tax Rate (T) and Revenue ("Laffer Curve") for the OECD Member Countries, 1965-1977

Country	Taxation and GDP					"Laffer Curve"					
	constant	T	$\bar{R}^2$	F	DW	constant	T	T^2	$\bar{R}^2$	F	DW
Australia	- 240.69	10.71	0.916	131.99**	1.62	126.61	11.77 (1.17)	0.28 (1.95)	0.934	85.87***	1.47
Austria	- 382.37	116.21	0.942	195.91**	1.34	6,412.17	- 385.30 (4.00)	5.85 (5.06)	0.960	145.93**	1.53
Belgium	- 5,056.11	182.09	0.956	264.78**	1.46	2,491.88	- 186.60 (6.32)	3.66 (13.47)**	0.980	295.82***	2.22
Canada	- 384.15	16.22	0.433	10.16**	0.37	370.74	- 28.85 (0.64)	0.58 (0.44)	0.485	6.65	0.56
Denmark	- 255.36	10.44	0.489	12.50**	0.36	- 221.90	9.53 (0.11)	-5.73 (0.02)	0.551	8.35***	0.31
Finland	- 259.53	9.12	0.883	91.97**	1.66	- 35.07	0.64 (0.11)	0.06 (0.37)	0.914	64.70**	1.71
France	- 8,144.71	252.20	0.796	47.83**	0.64	-13,008.79	619.45 (0.57)	-1.69 (0.39)	0.838	31.95***	0.81
Germany	- 3,131.63	113.91	0.918	135.72**	1.94	- 753.70	12.41 (0.01)	0.51 (0.06)	0.938	92.19**	1.98
Greece	- 2,025.77	102.09	0.599	18.92**	0.55	- 1,623.14	153.52 (2.36)	3.74 (3.41)	0.738	17.91***	0.66
Ireland	- 11.76	0.45	0.791	46.37**	1.03	- 9.64	0.74 (4.21)	0.01 (6.37)	0.870	41.03**	2.03
Italy	-301,268.40	12,227.25	0.585	17.89**	0.78	472,632.60	-32,551.25 (6.34)	580.19 (8.48)**	0.813	27.02***	0.44
Japan	-401,080.50	24,946.78	0.790	46.25**	0.81	100,266.00	6,071.12 (0.05)	-1.81 (0.00)	0.812	26.91**	0.69
Luxembourg	- 58.64	3.29	0.732	33.71**	0.86	- 168.70	8.15 (7.65)**	-0.08 (4.37)	0.934	85.86***	1.80
Netherlands	- 568.91	17.21	0.932	164.42**	0.59	- 908.13	50.11 (25.88)**	0.71 (35.61)**	0.982	333.21**	1.40
New Zealand	- 25.30	1.14	0.879	88.25**	1.99	- 6.97	0.22 (0.04)	0.00 (0.04)	0.906	58.86***	1.88
Norway	- 261.36	8.78	0.786	45.18**	0.38	- 584.94	31.90 (8.33)**	0.45 (10.93)**	0.900	54.72***	0.78
Portugal	- 907.20	52.03	0.818	54.95**	1.19	- 476.86	51.25 (3.20)	1.44 (5.39)	0.885	46.98***	1.63
Spain	- 14,556.46	983.08	0.605	19.40**	1.14	8,156.85	-1,040.97 (3.66)	34.16 (5.48)	0.756	19.61**	1.06
Sweden	- 408.61	14.39	0.953	245.92**	1.14	- 34.58	1.25 (0.14)	0.13 (2.88)	0.973	216.60**	1.16
Switzerland	- 98.81	8.09	0.837	62.78**	0.53	- 151.23	10.82 (10.17)**	-0.15 (5.07)	0.962	153.19**	1.00
Turkey	- 1,242.04	75.91	0.791	46.33**	1.41	- 766.49	88.01 (5.73)	2.59 (8.61)**	0.885	47.02**	2.22
United Kingdom	- 202.59	7.75	0.175	3.54	0.30	- 326.53	17.02 (0.07)	-0.19 (0.05)	0.171	2.24	0.28
United States	- 4,451.53	191.62	0.457	11.11**	0.61	2,086.38	191.25 (0.03)	4.49 (0.05)	0.479	6.52	0.64

**Significant at the 1 per cent level. - F-test in parentheses.

Source: Calculated from OECD [1979].

Table A5 - Cross-Section Analysis between GDP per Capita and Average Tax Rate (T) and between Tax Revenues per Capita and Average Tax Rate (T) for the OECD Member Countries

Year	GDP per Capita and Average Tax Rate				
	constant	T	$\bar{R}^2$	F	DW
1965	- 61.57	63.90	0.219	7.18	1.58
1970	- 66.41	81.52	0.240	7.96	1.77
1977	-153.34	175.92	0.295	10.21**	1.93
Mean for 1965-1977	-166.64	112.56	0.292	10.07**	1.81

Year	Tax Revenues per Capita and Average Tax Rate					
	constant	T	T^2	$\bar{R}^2$	F	DW
1965	-1,252.18	104.22 (3.382)	-1.42 (1.716)	0.549	14.40**	1.27
1970	- 889.46	65.98 (0.734)	-0.35 (0.073)	0.538	13.80**	1.63
1977	- 126.88	7.244 (0.048)	1.63 (0.795)	0.681	24.44**	1.82
Mean for 1965-1977	- 543.01	38.07 (0.146)	0.49 (0.091)	0.627	19.49**	1.69

**Significant at the 1 per cent level. - F-test in parentheses.

Source: Calculated from OECD [1979].

Table A6 - The Mean for Various Indicators^a of Taxation and their Standard Deviations for the OECD Member Countries, 1965-1977

Country	Mean for $\dot{Y}_R$	Std. dev.	Rank no.	Mean for TDIR/Y	Rank no.	Mean for TIND/Y	Rank no.	Mean for TDIR/T	Rank no.	Mean for TIND/T	Rank no.
Australia	4.49	2.06	10	20.17	15	6.54	19	75.44	3	24.56	21
Austria	4.54	2.24	8	21.19	13	15.70	2	57.36	19	42.64	5
Belgium	4.10	2.45	12	24.72	6	11.83	9	67.24	12	32.76	12
Canada	4.90	2.01	6	20.02	16	10.89	11	64.59	14	35.41	10
Denmark	3.55	2.51	17	24.18	7	14.66	4	61.94	15	38.06	9
Finland	4.08	3.41	14	21.34	11	13.75	6	60.49	17	39.51	7
France	4.58	1.71	7	22.08	10	14.15	5	60.84	16	39.16	8
Germany	3.58	2.82	16	23.87	8	10.44	13	69.41	10	30.59	14
Greece	6.22	3.42	3	12.21	21	11.86	8	50.55	22	49.45	2
Ireland	3.78	1.89	15	15.50	18	15.61	3	49.65	23	50.35	1
Italy	4.10	2.90	12	20.28	14	10.80	12	65.04	13	34.96	11
Japan	8.00	4.49	1	14.57	19	5.41	23	72.55	7	27.45	17
Luxembourg	2.96	4.80	19	28.70	3	7.89	17	78.20	2	21.80	22
Netherlands	4.33	2.31	11	30.42	1	11.01	10	73.31	6	26.69	18
New Zealand	2.84	2.83	20	21.33	12	7.39	18	74.04	5	25.96	19
Norway	4.51	1.31	9	24.74	5	16.55	1	59.87	18	40.13	6
Portugal	5.70	4.16	4	12.08	22	10.31	14	53.85	21	46.15	3
Spain	5.45	2.37	5	12.62	20	5.94	21	67.46	11	32.54	13
Sweden	2.47	2.25	22	30.30	2	12.25	7	70.88	9	29.12	15
Switzerland	2.48	3.52	21	18.96	17	6.21	20	74.80	4	25.20	20
Turkey	6.70	2.49	2	11.32	23	8.90	16	55.13	20	44.87	4
United Kingdom	2.23	2.40	23	24.99	4	10.03	15	71.28	8	28.72	16
United States	3.38	2.78	18	23.52	9	5.50	22	81.01	1	18.99	23

$^a\dot{Y}_R$ = rate of real growth; TDIR/Y (TIND/Y) = ratio of direct (indirect) taxes to GNP; TDIR/T (TIND/T) = ratio of direct (indirect) taxes to total taxes.

Table A7 – Results of the Time-Series Analysis between Taxation and Real Growth for the OECD Member Countries, 1965-1977

Country	Direct Taxation and Real Growth					Indirect Taxation and Real Growth				
	constant	$TDIR/Y^a$	$\bar{R}^2$	F	DW	constant	$TIND/Y^b$	$\bar{R}^2$	F	DW
Australia	16.44	-0.59	0.218	4.35	2.15	24.32	-3.03	0.211	4.22	2.35
Austria	11.81	-0.34	0.015	1.18	2.44	-3.10	0.49	-0.023	0.73	2.45
Belgium	10.06	-0.24	0.087	2.14	2.16	-8.68	1.08	0.024	1.29	2.17
Canada	12.87	-0.40	0.128	2.76	2.09	16.34	-1.05	-0.048	0.45	1.85
Denmark	9.18	-0.23	0.067	1.86	2.35	-1.69	0.36	-0.060	0.32	2.25
Finland	15.40	-0.53	0.226	4.51	1.61	3.51	0.04	-0.091	0.00	1.26
France	15.83	-0.51	0.263	5.28*	2.16	-36.50	2.90	0.628	21.26*	2.07
Germany	10.90	-0.31	-0.008	0.91	1.85	-19.15	2.18	0.057	1.73	2.05
Greece	14.88	-0.71	0.045	1.57	1.91	-16.10	1.88	0.036	1.45	1.69
Ireland	3.41	0.02	-0.090	0.01	1.38	-2.38	0.39	-0.053	0.40	1.60
Italy	11.36	-0.36	0.062	1.80	2.39	-1.64	0.53	-0.032	0.63	2.27
Japan	27.28	-1.32	0.390	8.68*	1.67	-33.78	7.72	0.439	10.40*	1.80
Luxembourg	12.51	-0.33	0.078	2.01	1.97	24.83	-2.77	0.209	4.17	2.07
Netherlands	13.57	-0.30	0.114	2.54	2.34	9.05	-0.43	-0.080	0.11	2.04
New Zealand	12.12	-0.44	0.130	2.79	1.01	52.76	-6.75	0.187	3.76	1.05
Norway	2.01	0.10	-0.029	0.66	2.24	3.41	0.07	-0.081	0.10	2.20
Portugal	13.61	-0.65	-0.010	0.88	2.16	7.59	-0.18	-0.088	0.03	2.02
Spain	12.35	-0.55	0.251	5.03*	1.73	-6.61	2.03	0.375	8.20*	1.63
Sweden	10.94	-0.28	0.346	7.35*	2.02	25.14	-1.85	0.236	4.71	1.06
Switzerland	12.72	-0.54	0.287	5.84*	1.67	-70.63	11.77	0.489	12.47*	2.34
Turkey	6.80	-0.01	-0.091	0.00	2.64	-1.41	0.91	-0.046	0.48	2.82
United Kingdom	15.04	-0.51	0.123	2.68	2.41	7.63	-0.54	-0.071	0.20	2.30
United States	26.06	-0.96	0.155	3.20	1.58	14.52	-2.03	-0.069	0.23	1.52

[a] TDIR/Y = ratio of direct taxes to GNP. - [b] TIND/Y = ratio of indirect taxes to GNP. - * Significant at the 5 per cent level.

Source: Calculated from OECD [1979].

Table A8 - Results of the Multiple Regression Analysis between Taxation and Real Growth for the OECD Member Countries, 1965-1977

Country	Constant	TDIR/Y[a]	TIND/Y[b]	$\bar{R}^2$	F	DW
Australia	22.84	-0.35 (0.73)	-1.71 (0.63)	0.191	2.42	2.42
Austria	8.10	-0.28 (0.43)	0.16 (0.04)	-0.079	0.56	2.51
Belgium	5.81	-0.21 (0.74)	0.29 (0.04)	0.000	1.00	2.18
Canada	23.82	-0.39 (2.59)	-1.01 (0.48)	0.084	1.55	2.14
Denmark	- 1.36	-0.35 (3.76)	0.92 (2.12)	0.153	2.08	2.67
Finland	22.36	-0.54 (4.21)	-0.49 (0.08)	0.156	2.11	1.54
France	33.52	-0.05 (0.05)	2.77 (9.91)*	0.593	9.74*	2.08
Germany	-27.16	0.11 (0.04)	2.69 (0.72)	-0.033	0.81	2.10
Greece	-13.83	-1.02 (3.55)	2.74 (3.42)	0.217	2.67	1.86
Ireland	- 4.23	-0.18 (0.22)	0.69 (0.58)	-0.134	0.29	1.79
Italy	8.27	-0.32 (1.10)	0.22 (0.09)	-0.023	0.87	2.42
Japan	-15.82	-0.43 (0.21)	5.58 (1.10)	0.396	4.93*	1.74
Luxembourg	24.88	0.01 (0.00)	-2.80 (1.66)	0.130	1.90	2.07
Netherlands	4.90	-0.40 (2.80)	1.07 (0.50)	0.071	1.46	2.49
New Zealand	49.22	-0.31 (1.42)	-5.38 (2.22)	0.217	2.67	1.15
Norway	2.98	0.20 (0.86)	-0.21 (0.33)	-0.096	0.48	2.26
Portugal	5.12	-1.84 (2.16)	2.22 (1.28)	0.015	1.09	1.98
Spain	- 2.50	-0.15 (0.19)	1.66 (2.20)	0.325	3.89	1.64
Sweden	27.36	-0.24 (6.44)*	-1.44 (4.07)	0.489	6.74*	1.82
Switzerland	-52.29	-0.22 (0.82)	9.48 (5.09)*	0.480	6.54*	2.38
Turkey	- 2.50	0.04 (0.03)	0.98 (0.46)	-0.147	0.23	2.85
United Kingdom	20.38	-0.51 (2.49)	-0.53 (0.22)	0.056	1.36	2.28
United States	45.81	-1.04 (3.53)	-1.33 (0.70)	0.131	1.91	1.58

[a]TDIR/Y = ratio of direct taxes to GNP. - [b]TIND/Y = ratio of indirect taxes to GNP. - *Significant at the 5 per cent level. - F-values in parentheses.

Source: Calculated from OECD [1979].

344

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