WIIW Working Papers

No. 16
July 2001

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Abstract

In a simplified model GDP growth depends on the demand effect of private investment growth and on the growth of the private savings ratio. In a generalized model private investment (IP) has to be supplemented by the trade balance (E) and the budget deficit (D), their sum being termed NPCE (Non-Private-Consumption-Expenditures). Hence GDP growth depends, in the generalized case, on the demand effect of NPCE growth and on changes in the private savings ratio. In the present paper the term NPCE (given the import and tax coefficients) is treated as independent of GDP, hence exogenous in the model. In contrast, the private savings ratio does depend on GDP, especially on the distribution of disposable GDP between undistributed profits of firms and private households, as well as the latter's propensity to save.

Using this model the relation between growth and private savings in the USA and in Japan between 1960 and 2000 is investigated in the paper. The results of the analysis of the period 1996-2000 are of special interest. In the USA a sharp decline of the private savings ratio helped to achieve a high rate of GDP growth at a stagnating NPCE term. In Japan an increase in the private savings ratio provoked an almost stagnating GDP although the NPCE term increased rather substantially. These results prove that spendthrift in the USA (especially of the private households) turned out to be a collective blessing while thrift in Japan has become a collective fault.

The causes of the different developments of the private savings ratio in the USA and Japan require further research. We have found that in the USA the private savings ratio depends not only on income of but also on wealth, defined as equity shares at market value, owned by private households.

Keywords: growth, savings, private investment, trade balance, budget deficit, propensity to save of private households, USA, Japan

JEL classification: B22, E12, E20, H62

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Growth and Savings in USA and Japan

I   Introduction

1. The present study is guided by the idea that the theory of effective demand can serve to explain, better than competing theories, not only old questions but new ones as well. Such a new question is raised by the medium-term changes in the savings ratio which recently have exerted a strong influence on the economic development in some major capitalist countries. The research of this question – theoretical and empirical – is the topic of the present paper.

The propensities to invest and to save occupy a central role in the theory of effective demand. Investing means an activity creating demand for goods and services without any current supply of them, saving means an activity withdrawing demand derived from current supply of goods and services. When we apply this approach to the whole economy it is evident that independent decisions to invest and to save must be in some way co-ordinated because *ex post* aggregate investment and aggregate savings equal each other. According to the theory of effective demand, it is investment (and similar activities) that determines the amount of savings in the economy. Thus, the propensity to save cannot influence the amount of savings, it influences, however, the amount of consumption, which goes together with a given investment. If the savings ratio is relatively low, the multiplier process leads to relatively high consumption. Conversely, if the savings ratio is relatively high, the result of the multiplier process is a relatively low consumption level. Hence, the savings ratio determines after all not saving but the consumption accompanying given saving, or it determines final output at such a level that saving out of this output fits the prevailing savings ratio. The result is called the 'savings paradox' because the higher (lower) the propensity to save the smaller (higher) the GDP. But it is a paradox only if one assumes – as mainstream economics as a rule does – that the distribution of GDP between consumption and savings has nothing to do with the determination of the very size of GDP.

In the present paper we are going to apply the 'savings paradox' dynamically. We do not assume that investment is given but that the growth rate of investment (and similar activities) is given. Then we analyse the rate of growth of GDP which accompanies the given rate of growth of investment by looking at the growth rate of the savings ratio. Here, also, the higher (lower) the growth rate of the savings ratio the lower (higher) the growth rate of GDP accompanying the given growth rate of investment. We are interested not in cyclical fluctuations but in medium-term changes, trying to find out whether some tendencies in the time profile of the savings ratio can be detected and what was their influence upon the level of economic activity given the time profile of investment (and

similar activities). Where possible we also look for some determinants of the changes of the savings ratio itself.

2. In Part II of the paper we sketch the theoretical background of the relation between effective demand and private savings. The tools derived from this analysis are used in Part III for an empirical study of the economic development in the USA and in Japan in 1960-2000. The last part of the paper is devoted to conclusions. Annexes I-V present more detailed results of empirical research.

II   Effective demand and savings

3. We introduce the symbols

$$(W + RD) + RN + T = GDP = CP + CG + IP + IG + (X - M) \qquad (1)$$

with the following meaning:

W + RD	wages (including salaries) W and distributed profits RD, representing incomes of private households, minus direct taxation (including social security payments) plus all kind of received social (money) transfers; we call this sum also YDH, disposable income of private households
RN	non-distributed profits (gross in the sense of including amortization) minus direct taxation, representing incomes of firms
T = tGDP	where T net revenues of the General Government (further Government) budget to be used for buying goods and services and t the tax rate
GDP	gross domestic product
YD	disposable income defined as GDP - T
CP	private consumption expenditures
CG	Government consumption expenditures
IP	private investment expenditure (private gross capital formation)
IG	Government investment expenditure (Government gross capital formation)
M = mGDP	where M imports of goods and non-factor services and m the import ratio
(X -M) = E	trade balance E, i.e. exports X minus imports M of goods and non-factor services
SH = (W + RD) - CP	private households' savings
SP = SH + RN	private savings as the sum of private households' SH and firms' savings RN, respectively.

Equation (2) derived from (1) enumerates factors which determine private savings[1],

$$SP = IP + D + E, \qquad (2)$$

where D denotes the deficit of the (general) Government budget, defined as the difference between Government expenditures CG + IG and Government revenue T. We have

$$D = CG + IG - T = IG - (T - CG) = IG - SG,$$

where SG = T - CG denotes Government saving; hence the budget deficit D can also be defined as the difference between Government investment and Government saving. According to the theory of effective demand, the sum of private investment, budget deficit and the trade balance determines, but is not determined by, private saving. We shall call the sum IP + D + E for short Non Private Consumption Expenditures NPCE, hence we can write (2) also in the form

$$SP = NPCE. \qquad (2')$$

Assuming a closed model without a Government, we get

$$SP = IP, \qquad (3)$$

the famous equality between private investment and private saving. Very helpful in understanding of (3) is the distinction between investment decision IPD and investment realized IP, introduced by Kalecki. As there exists a necessary time lag between the investment decision and its realization, we have IP(t) = IPD(t - 1), where the time lag has been chosen as a time unit. The distinction between IPD and IP does not apply to an increase (or decrease) in inventories above (or below) the desired level due to unexpected difficulties in finding markets (or an unexpected expansion of markets). We shall ignore this kind of investment because it cannot last for long. On the other hand, some investment decisions may be revoked, but this would not occur very often. We shall assume also that investment decisions are made in real terms (a building, a factory, a piece of equipment etc.).

The equation SP(t) = IP(t) is nothing but an identity because we get saving and investment by deducting private consumption from GDP. Therefore the equation itself cannot help in explaining the direction of causality. But the time lag between IP and IPD can. Indeed, from SP(t) = IP(t) we get SP(t) = IPD(t - 1) because investment of a given period is equal to

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[1]   The concept of savings used here is that of domestic savings. It differs from national savings which take into account not only the trade balance but the whole current account balance.

investment decision one period earlier. It is obvious that savings of the period t cannot determine investment decision of the period (t - 1). Also the assumption that present investment decision may be based on expected savings should be dismissed. Indeed, such expectations would always have to be hundred per cent correct in order to assure the definitional identity of investment and saving in any given period. Lastly, the thesis that savings of period t, denoted SP(t), determines investment decision in the same period, denoted IPD(t), and hence investment in period t + 1, denoted IP(t + 1), leads to a logical difficulty. Indeed, let us start with the definition SP(t) = IP(t) and assume that IPD(t) = SP(t), i.e. that savings in period t determines investment decision in the same period. We get then IP(t + 1) = IPD(t) and come to the strange conclusion that IP(t + 1) = IP(t), i.e. that investment is constant over time. Because investment over time is not constant, the assumption that savings of a given period determines investment decision of the same period (and consequently investment of the subsequent period) should be dismissed. It is rather saving which follows investment and not the other way round. Indeed, the assumption that investment of a given period determines saving of the same period does not lead to any logical difficulty if we take into account the process by which income and savings are created in subsequent rounds of the multiplier by an initial investment push. Investment creates in a natural way 'its own' savings while saving cannot create 'its own' investment.

The thesis that saving does not determine investment does not mean, however, that saving does not influence investment decisions in an important way. This remark applies especially to that part of savings that are appropriated by firms (non-distributed profits). Savings of firms increase firms' own capital, hence they positively influence firms' investment decisions by providing finance. Indirectly they play the same role by facilitating access to the capital market and by allowing firms to expose themselves to the increasing risk that is always involved in new investment decisions.

4. From (1) we get for an open economy with the state

$$(W + RD - CP) = (IP - RN) + (IG - SG) + (X - M) \qquad (1')$$

where each term in brackets represents a separate sector. When there is no state and no outside world, the two corresponding terms disappear and we are left with only two terms: the first, (W + RD - CP), representing the private household sector, the second, (IP - RN), the firm sector. If the household sector spends its income completely, we have RN = IP, i.e. equality between private savings SP and private investment IP, because in this special case SH = 0 and firms' savings (non-distributed profits) RN is the only form of private savings SP. If, however, private households save, i.e. they spend less than they earn (SH > 0), the firm sector has to spend more on investment than it earns in the form of non-distributed profits. In other words, savings of the private household sector depend on the

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readiness of the firm sector to indebt itself by exactly the same amount. We have then SH = (IP - RN), leading also to equality between SP = SH + RN = IP. Now, if the state and the outside world exist, SH depends also on the readiness to indebt itself of the Government (if it spends more on investment than it saves) and of the outside world (if it buys more than it sells). Hence, we have from (1')

$$SH = (IP - RN) + (IG - SG) + (X - M) \text{ and } SH + RN = SP = IP + D + E$$

as required by (2). Private investment is non-negative while the budget deficit D and the trade balance E can be also negative. If e.g. D is negative, we have a budget surplus and this item *per se* reduces *ceteris paribus* private savings. The same applies to a negative E, i.e. an import surplus.

5. We define coefficient q= SP/GDP as the private savings ratio with respect to GDP. From (2), using coefficient q, we get

$$GDP = NPCE/q = (IP + D + E)/q. \tag{5}$$

According to (5) GDP depends on NPCE and q. From (5) we get by logarithmic derivation after time

$$g(GDP) = g(NPCE) - g(q) \tag{6}$$

where

$$g(NPCE) = [a_1 \, g(IP) + a_2 \, g(D) + a_3 \, g(E)].\,^2 \tag{7}$$

The terms g(i) denote the growth rate of i, i = GDP, NPCE, IP, D, E, q. Equations (5) to (7) are important analytical tools when the relation between GDP, NPCE and q is considered. According to (5) GDP depends both on NPCE and q. We shall use this relation as the initial step in the empirical part of the study.

Coefficient q measures private savings SP in relation to GDP, but from the point of view of decisions made by private economic agents it is important to relate private savings rather to YD, the disposable part of GDP. We have then

$$q = SP/GDP = (SP/YD)(YD/GDP) = sp(1-t), \tag{8}$$

where sp is the private savings ratio in relation to YD. From (8) we get

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[2]   The coefficients a_1, a_2, a_3 are weights attached to the rates of growth of IP, D and E, respectively. We have $a_1 = IP/(IP+D+E))$, $a_2 = D/(IP+D+E)$ and $a_3 = E/(IP+D+E)$.

$$g(q) = g(sp) - a_4 \, g(t) \qquad\qquad (9)$$

where a_4 is the weight attached to $g(t)$.[3]

Hence

$$g(q) - g(sp) = - a_4 \, g(t) \qquad\qquad (9')$$

and with increasing proportional tax rate t the difference between g(q) and g(sp) decreases.

Private savings depend on the distribution of disposable income between firms and households and their respective propensities to save. We relate firms' savings to disposable income YD as $rn = RN/YD$ and private households' savings SH to disposable income of private households as $sh = SH/YDH$, where $YDH = YD - RN$ to get

$$sp = (RN + SH)/YD = rn + sh(1\text{-}rn). \qquad\qquad (10)$$

From (10) after few manipulations we get

$$g(sp) = a_5 \, g(rn) + a_6 \, g(sh) \qquad\qquad (10')$$

an equation that relates the growth of the ratio sp to the growth rates of the ratios rn and sh and where a_5 and a_6 are the corresponding weights.[4]

Because coefficient q depends on the distribution of disposable income between firms and private households, on the decisions of private households to consume or to save, as well as on the decision of the Government concerning the tax rate, it is determined by social, behavioural and administrative factors. Thus it may be used together with NPCE, which is a semi-exogenous variable as a factor co-determining the volume and growth of GDP.

6. NPCE is treated in our analysis as a semi-exogenous variable because of the following argument. IP, the most important part of NPCE, is based on previous investment decisions and therefore is independent of GDP of the same period. Also the terms G and X are exogenous because they depend on Government decisions of the preceding period (G) or on the demand of the outside world (X). On the other side terms like T and M are clearly dependent on current GDP. Hence we can write

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[3]   The weight a_4 is equal to $t/(1\text{-}t)$.

[4]   The weights are $a_6 = rn/sp$ and $a_6 = (1\text{-}rn)(sh/sp)$.

$$NPCE = IP + G + X - (t+m) \ GDP \ and \ NPCE = IP'- (t+m)GDP,$$

where IP' = IP + G + X. By inserting NPCE/[sp(1- t)] instead of GDP we get

$$NPCE = IP'- (t+m)NPCE/[sp(1-t)].$$

By rearranging terms we get the relation between NPCE and IP'

$$NPCE = \{[sp(1-t)] /[sp(1-t) + (t + m)]\} \ IP' \qquad (8)$$

and we see that at given IP' and q the term NPEC is a decreasing function of t and m. Indeed with given G and X, the budget deficit D and the trade balance E, elements of NPCE, would decrease when GDP increases. Using (8) we could also rewrite (5) substituting IP' for NPCE to get

$$GDP = NPCE/[sp(1-t)] = IP'/[sp(1-t) + (t + m)]. \qquad (5')$$

According to equation (5') GDP depends on an autonomous term IP' given the parameters sp, t and m. We shall use, however, the simpler equation (5) and only in some necessary cases also the equation (5').

7. Existing capacity does not determine actual output GDP but only its potential level GDP*, where GDP = GDP*. If we denote the existing capital stock by K and the technical capital/output ratio by v, then potential output GDP* = (K/v). GDP* means aggregate output at full utilization of capacity, where full utilization implies also the necessary flexibility of output with respect to demand and its structure. We assume that potential output GDP* implies full employment in the sense that at this output level there exists no other than frictional unemployment, being a relatively small fraction of the total labour force. This condition seems to be fulfilled in developed economies. The capital stock increases by I = IP + IG and decreases by dK, where d denotes the coefficient by which capacity is worn out. The increase of the capital stock is then ?K = I - dK and the growth rate of the capital stock is g(K) = (I/K) - d. Potential output GDP* increases by ?GDP* = ?K/v and the growth rate of GDP* is

$$g(GDP*) = g(K) = (I/K) - d. \qquad (10)$$

It should be stressed that this equality holds only when both v, the technical capital/output ratio, and d, the amortization coefficient, are constant over time.

Given GDP* = K/v and GDP = NPCE/q, we get for the degree of capacity utilization u = GDP/GDP*

$$u = (NPCE/q)/(K/v) = (NPCE/K)/(q/v)$$

but

$$v = K/GDP^*,$$

hence

$$u = (NPCE/K)/[(qGDP^*)/K] = NPCE/qGDP^*. \qquad (11)$$

Given q, we can define $SP^* = qGDP^*$ as the full employment savings level. Hence, if NPCE expenditures happen to be at the level $qGDP^*$, we get $u = 1$, meaning that capacity is fully utilized. If, however, $NPCE < qGDP^*$, then the level of capacity utilization is $u < 1$.

The business cycle is a characteristic feature of the capitalist economy. It consists in the fluctuations of GDP. As capacity does not fluctuate in a similar way as output we have to assume that it is u, the degree of utilization of capacity, which changes over the business cycle. A considerable part of capital equipment lies idle in the slump, and even during the boom, when the maximum degree of utilization of capacity is being reached, u very seldom approaches unity. Hence, on the average the degree of utilization of capacity over the business cycle will be substantially below unity. Fluctuations in the utilization of labour parallel those in the utilization of equipment. Hence average employment throughout the cycle is considerably below the peak reached in the boom. The reserve of capital equipment and unemployment are typical features of a capitalist economy, mostly even at the top of the boom.

The fact that the capitalist economy shows as a rule $u < 1$ is its great weakness, because it cannot assure the full utilization of capacity which in normal circumstances it is able to create in abundance. This is also the major source of its strength, because it puts the producer under continuous pressure, forcing him to compete for the consumer by better quality of goods, by new goods, by lower prices, by publicity. Also the specific way in which in a capitalist economy the propensities to invest and to save are co-ordinated – and which are the main subject of the present paper – require underutilized capacity. Indeed the whole idea of private investment (or NPCE in a general case) and of the multiplier as driving factor of output imply that capacity is present and must be awakened to life by additional effective demand.

The capitalist economy puts the buyer in a privileged situation with respect to the seller because of aggregate demand remaining behind aggregate supply. If aggregate demand went ahead of aggregate supply the buyer instead of the producer would be put under pressure (Kornai, 1980). It is not difficult to find out whether the economy crosses the capacity limit, i.e. whether coefficient u tends to become higher than 1. Shortages of some goods and queuing for them, increasing import surpluses and first of all increasing inflationary pressures would signal such a danger.

Even before the economy crosses the capacity level, cost-push inflation may and does occur. It depends mostly upon unit labour costs and costs of imported inputs. Hence the increase of the nominal NPCE would produce quantity and price adjustment in the economy. But before the capacity level is being reached, the quantity adjustment would dominate the price adjustment. If all variables are measured in constant prices, the analysis of effective demand may be limited to quantity adjustment as is the case in the empirical part of this study.

8. It is important precisely to explain in which way the change in the private savings ratio q influences the size and growth of GDP. Because our basic approach is that private savings SP are determined by NPCE, the change of q cannot influence the size of savings. It can, however, and does influence the size of private consumption accompanying a given level of NPCE. Hence the counterintuitive result that increasing q diminish – and decreasing q increases – GDP is in the end rather obvious. It means simply that increasing q diminishes – and decreasing q increases – private consumption. Coefficient q is a fraction whose nominator SP = NPEC is given. Hence variations of q can and do materialize only by changes in the denominator GDP.

This formal argument can be supported by the following reasoning based on the famous reproduction schemes of Marx as adjusted by Kalecki.

Assume that the whole economy can be divided into two horizontally integrated sectors; sector 1 produces IP + G + X while sector 2 produces CP and both sectors use in addition to their own some imported inputs M. We have then

sector 1 $\qquad (W + RD)_1 + RN_1 + M_1 = IP + G + X,$

sector 2 $\qquad (W + RD)_2 + RN_2 + M_2 = CP,$

both sectors $\qquad W + RD \quad + RN \; + M \; = IP + G + X + CP.$

The demand of private households for consumer goods originating in sector 1 is $(W + RD)_1 - (SH + T)$, where SH and T denote savings of the private households and taxes, respectively. On the other hand, the surplus of consumer goods in sector 2, defined as final output CP minus its internal demand, is $RN_2 + M_2$. Hence the equilibrium condition on the consumer goods market is

$$(W + RD)_1 - (SH + T) = RN_2 + M_2. \qquad (12)$$

This equation is, however, not only an equilibrium condition; it is also the factor determining the size of final output. Indeed given the distribution of value added between incomes of private households and firms, and given the term IP + G + X, which is exogenous, the factor $(W + RD)_1$ is also given. The demand of private households of sector 1 for consumer

goods equal to $(W + RD)_1 - (SH + T)$ is the higher, the lower the sum $(SH + T)$. Add to both sides of (12) $RN_1 + M_1$ to get

$$(W + RD)_1 - (SH + T) + RN_1 + M_1 = RN_1 + RN_2 + M_1 + M_2$$

$$IP + (G - T) + (X - M) = RN + SH$$

and

$$NPCE = SP = RN + SH. \qquad (13)$$

Let us assume at the beginning that T and M are independent of GDP. Under this condition not only $IP + G + X$ are given but also $NPCE = IP + (G - T) + (X - M)$. At given NPCE and SP, higher savings of the private households SH mean simply lower internal savings of firms RN via lower output of sector 2 and lower GDP. Greater thrift of private households does not increase private savings; it only reduces output of sector 2 and hence GDP.

In real life T and M do depend on GDP. This factor makes the relation between SH, RN and SP more complicated but does not change the basic line of causality. When SH increases, GDP decreases because demand for the surplus of consumer goods falls. However, the decline of GDP causes now the decline of both T and M, hence $D = G - T$ and $E = X - M$ increase *pari passu* with the decline of T and M. The increase of the budget deficit and of the export surplus increases NPEC and SP; hence RN declines when SH increases, as in the former case, but not to the same extent as SH increases because SP increases *pari passu* with D and E. The existence of GDP-dependent taxes and imports limits to a certain degree the fall of internal savings of businesses provoked by the initial increase of SH. In this sense the initial increase of SH does not only shift private savings from businesses to private households; to some degree it also increases total private savings, but only by reducing GDP and the related outflows of taxes and import expenditures. Thus, the increase of private saving in the case under consideration is due to the GDP decline, not to the greater thrift of private households.

The above-described process is exactly opposed to the mainstream approach according to which GDP is given and can be freely distributed between consumption and savings. In this framework, if q is increasing, private investment (or NPCE in a more general case) increases *pari passu* with decreasing consumption, and vice versa if q is decreasing. All this happens because IP (or NPCE in a more general case) do not depend on previous decisions. Although this approach is obviously untenable it is mostly accepted because it appeals to individual experience and common sense: the income of an individual private household is indeed given and can be distributed between consumption and savings. This commonsense approach fails however when applied to the whole economy because of the fallacy of composition.

Firms and private households decide about their savings ratio. Disregarding taxes these decisions lead to a certain q coefficient. Let us assume that longer-term growth of private investment in a closed economy without the state g(IP) is given by the intensity of technical progress and other factors. At given q the GDP growth rate g(GDP) = g(IP) is also given. Assume further that at this growth rate the utilization of capacity is at a satisfactory level. If *ceteris paribus* coefficient q were to increase, then GDP growth would be lower than g(IP), the utilization of capacity would be lower and unemployment higher in comparison to the reference situation characterized by a constant initial q. Keynes seemed to believe that in a capitalist economy left to itself the propensity to save may increase in relation to the propensity to invest and cause not only cyclical depressions but also longer-term difficulties. Kalecki also saw the main danger in an increasing coefficient q, especially when caused by external (rentier) savings in relation to internal savings of firms.

We know now that coefficient q can and does change not only over the business cycle but also over longer periods of time and in both directions. When technical progress is intensive and the growth rate of IP is high, the increase of the q coefficient is useful as it prevents the economy from overheating and from inflationary pressures which could manifest themselves at the given investment expansion at the initial savings ratio. On the other hand, the decrease of coefficient q, when investment growth is sluggish, may prevent GDP growth from slowing down *pari passu* with investment, the utilization of capacity from falling too strong and unemployment from increasing too much. The greatest danger arises when low investment activity is met by an increasing savings ratio; the mixture of low propensity to invest and high propensity to save poses a real danger to a capitalist economy. An appropriate economic policy in this situation is necessary and possible but it requires first of all an understanding of the mechanism by which decisions to invest and to save are co-ordinated in a market economy and of the decisive role of effective demand in determining the level of economic activity.

9. The idea that GDP is determined by supply-side factors is deeply rooted in mainstream economics. If actual output is below its potential – full employment – level, the only possible reason is malfunctioning of the market, mostly of the labour market. According to this approach firms strictly follow the rule of profit maximization and under perfect competition they would expand output to the point at which their marginal costs would equal the price. This condition means that aggregate output, given the production function, is limited by the level of real wage. In order to have output at full employment level, the real wage has to be reduced. The real cause of unemployment is then the real wage being too high and the propensities to invest and to save have nothing to do with the problem. If only wages were 'right', the potential output level would be reached and distributed between consumption and savings according to the time preference of the private households and firms with respect to present and future consumption.

Sometimes elements of effective demand are being intertwined with the profit maximization rule. Keynes himself did not reject the profit maximization rule, but he assumed that effective demand determines the level of aggregate output and employment and that, only after this level of employment has been determined, real wages are being adjusted to the marginal product of labour. In the modern presentation of Keynesian economics, this sequence of events is as a rule reversed. Firms are assumed to produce according to the strict profit maximization rule but the size of the market depends on aggregate demand. This is done in most cases by confronting an aggregate demand (AD) curve with an aggregate supply (AS) curve in a price (P)–output (Y) diagram. Further it is assumed that the AD curve is declining while the AS curve (given the money wage level) is increasing. This construction is inconsistent because outside the equilibrium point, where both curves intersect, it assumes that employment according to AD and according to AS is different. Sometimes another construction is offered, according to which the AD curve is directly derived from the AS curve and is rather an increasing curve. But even in this case, although the previously stressed inconsistency does not arise, the role of aggregate demand is still a secondary one while the driving force of the dynamic process is the profit maximization rule. Hence it is the level of the real wage (or of the price level given the nominal wage rate), and not of aggregate demand, which directly determines the level of employment.[5]

III   GDP growth and the savings ratio in the USA and in Japan, 1960-2000

A   Introductory remarks

10. In the empirical part of the study we shall analyse the relation between growth rates of GDP and NPCE and the role played by the private savings ratios as a link between these two variables. The results for USA and Japan are presented separately in two sections. Each section is organized in the same way. We start by presenting raw data on yearly growth rates g(GDP) and g(NPCE). It is possible to investigate these data using the theory of effective demand, and this is the most relevant approach if a short-term analysis is intended. In this paper, however, we want to avoid the analysis of cyclical changes characteristic for a capitalist economy and concentrate on medium-term changes. We decided to choose a five-year period as the minimum time span that can serve this purpose assuming that cyclical changes within the periods do not make their comparison impossible. Thus in the next step we present data for eight five-year periods covering the whole time span 1960-2000. The limit years between periods are the years 0 and 5; hence we present structural data for the years 1960, 1965, 1970 etc. and average growth rates (in per cent p.a.) for the years 1961-65 (base year 1960), the years 1966-70 (base year 1965)

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[5]   For a detailed treatment of this topic see Bhaduri, Laski and Riese (1999).

etc.[6] In a further step the coefficients q and g(q) are introduced and linked with data on GDP and NPCE. The last step in each section is a detailed investigation of coefficient q and its elements. We try to answer whenever possible the causes of the detected movement of different savings ratios or at least formulate questions for further research in this domain.

B   GDP growth and the savings ratio in the USA, 1960-2000

11. We start by presenting data on GDP and NPCE growth in the USA in 1961-2000. As can be seen from Graph 1, g(GDP) is higher than g(NPCE) in some years while in others the opposite is true; this implies changes of coefficient q in a given year because otherwise the two rates would be equal.

Graph 1

GDP and NPCE growth rates USA, 1961-2000

(in per cent)

GDP and NPCE

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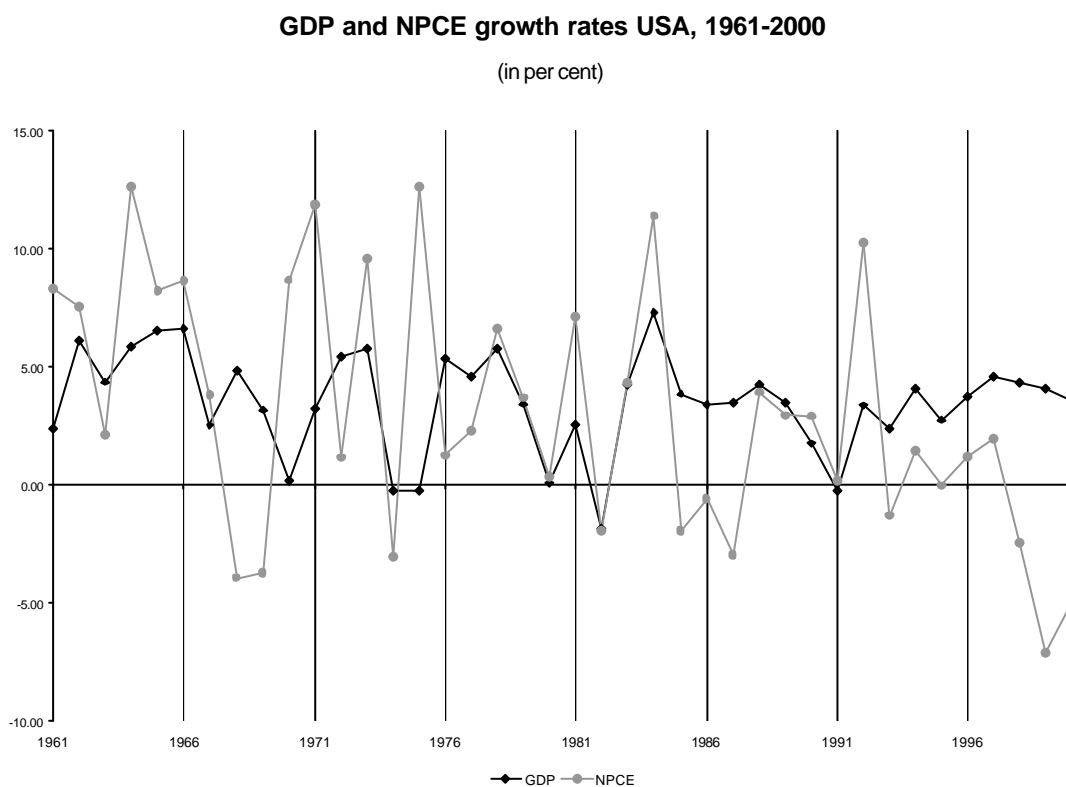
[6]   As our analysis concentrates on five-year periods the limit years play some role in the results and may be misleading. Therefore we present in Annex I and IV results we have obtained by comparing five-year average data with the preceding ones. Hence we have the structure of effective demand for an average GDP 1961-65 and 1966-70 and average growth rates (in per cent p.a.) of GDP and its elements between two periods. Then we compare 1971-75 with 1966-70 etc. The comparison of the two methods proves that the initial results are not accidental and show in principle the same tendencies. For details see Annex I and IV.

We are looking for some tendencies in this relation and proceed, in Table 1, to data presenting the structure of final demand in the USA in limit years. The share of disposable GDP in GDP was very stable between 1960 and 1970 (at about 80 per cent), relatively stable between 1975 and 1995 (at about 84 to 85 per cent) and low in 2000. The share of CP in GDP was almost stable between 1960 and 1985 at about 63 to 64 per cent and increased thereafter to 66 to 68 per cent in 1990-2000. The share of NPCE in GDP increased from 16 per cent in 1960 to about 20 per cent in 1975-85 and declined thereafter to reach an extraordinarily low level of about 13 per cent in 2000. Between 1960 and 1990 the share of IP in GDP moved more or less similarly to that of NPCE; however, after 1990 the share of IP in GDP increased by 2.8 percentage points while that of NPCE declined substantially. Thus other factors than IP were mainly responsible for this development. The Government budget continuously increased its deficit from 0.3 per cent of GDP in 1960 to about 5 per cent in 1975 and remained in the range of 3 to 5 per cent of GDP until 1995. However, D recorded a surplus of 1.4 per cent in 2000; hence the share of D in GDP declined by 5.8 percentage points between 1990 and 2000. On the other hand, a slight export surplus between 1960 and 1975 was replaced by an import surplus thereafter; between 1990 and 2000 this surplus increased by 2.4 percentage points. Thus the sum of D + E decreased by 8.2 percentage points between 1990 and 2000.

Table 1

Structure of aggregate demand
USA, 1960-2000

(in per cent)

	1960	1965	1970	1975	1980	1985	1990	1995	2000
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
T	19.7	19.1	19.3	15.7	16.7	14.9	15.2	14.5	18.3
YD	80.3	80.9	80.7	84.3	83.3	85.1	84.8	85.5	81.7
C	81.1	79.1	81.8	81.7	80.3	82.4	83.5	82.9	82.9
CP	64.2	62.7	63.3	63.7	63.6	65.0	66.6	67.7	68.8
CG	16.9	16.4	18.5	18.0	16.7	17.5	16.9	15.1	14.1
NPCE	16.1	18.2	17.4	20.6	19.6	20.1	18.2	17.8	12.9
IP	15.2	16.7	14.9	14.2	17.2	17.6	15.0	15.6	17.8
D	0.3	1.0	2.4	5.5	2.9	5.2	4.4	3.4	-1.4
E	0.5	0.6	0.1	0.8	-0.5	-2.7	-1.2	-1.1	-3.5
SG	2.8	2.7	0.8	-2.3	-0.03	-2.6	-1.7	-0.7	4.1

Memorandum items
GDP
(1995 prices),
USD billion

	1960	1965	1970	1975	1980	1985	1990	1995	2000
	2275.6	2906.0	3440.8	3939.4	4746.7	5540.7	6501.6	7337.5	8947.7

Source: Ameco Database.

12. The growth of GDP and its components is presented in Table 2. GDP grew in most periods by over 3 per cent; the lowest growth rates were registered in the first half of the 1970s and 1990s, the highest in 1961-65 and 1996-2000. YD moved almost *pari passu* with GDP, but in 1996-2000 much more slowly than GDP. Private consumption increased mostly in line with YD; it remained strongly behind YD in 1961-64 and 1971-75 and grew much faster than YD in 1996-2000. NPCE increased faster than GDP in the first half and slower than GDP in the second half of the 1960s, 1970s and 1980s; in 1991-95 NPCE continued to grow more slowly than GDP and in 1996-2000 both NPCE and GDP declined by 2.4 per cent. This was the only five-year period in which NPCE declined. Private investment grew very fast in 1961-65, 1976-80 and 1996-2000. IP grew very slowly in 1966-70 and declined in 1986-90. The budget deficit increased fast between 1961 and 1975 and then in 1981-85. It declined dramatically in the 1990s. Relevant for the national economy was the fast growth of the import surplus in 1981-85 and 1996-2000.

Table 2

Average growth rates of NPCE and GDP and their components
USA, in eight five-year period,1960-2000

(in per cent p.a.)

	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000
GDP	5.01	3.44	2.74	3.80	3.14	3.25	2.45	4.05
T	4.41	3.63	-1.44	5.09	0.75	3.73	1.46	9.01
YD	5.16	3.39	3.65	3.55	3.60	3.17	2.62	3.11
C	4.49	4.13	2.71	3.46	3.68	3.51	2.29	4.06
CP	4.51	3.63	2.88	3.77	3.58	3.77	2.78	4.37
CG	4.40	5.95	2.14	2.31	4.03	2.53	0.26	2.64
NPCE	7.69	2.52	6.23	2.81	3.65	1.19	2.00	-2.38
IP	6.91	1.08	1.86	7.87	3.61	-0.06	3.26	6.79
D	30.88	24.02	20.89	-8.60	15.79	0.02	-3.13	.
E	7.78	-24.11	52.42	49.89[b]	42.81	-11.84	0.84	29.73
SG	4.42	-18.85	20.96[a]	-57.83	160.76	-5.69	-14.95	114.63[c]

[a]1971-1974 [b]1977-1980   [c]1997-2000

13. We now turn to a graphical illustration (Graph 2) of equation (6), using data on g(GDP) and g(NPCE) from Table 2 and on g(q) from Table 3 further in the text. Coefficient q increased in the first half and decreased in the second half of the 1960, 1970s and 1980s. But in the 1960s and the 1970s as a whole the increase of q was stronger than its fall and GDP was therefore growing more slowly than NPCE. In the 1980s the fall of coefficient q was stronger than its increase, hence over the 1980s as a whole q decreased and GDP

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grew faster than NPCE. This was also the case in the 1990s, as in both five-year periods coefficient q declined. A spectacular development occurred in 1996-2000 when a negative growth rate of NPCE was overcompensated by a fall of the growth rate of coefficient q so strong that the growth rate of GDP after all was almost as high as in 1961-65.

Graph 2

**Growth rates of g(GDP), g(NPCE) and g(q),
USA, 1961-2000, eight five-year periods**

(in per cent)
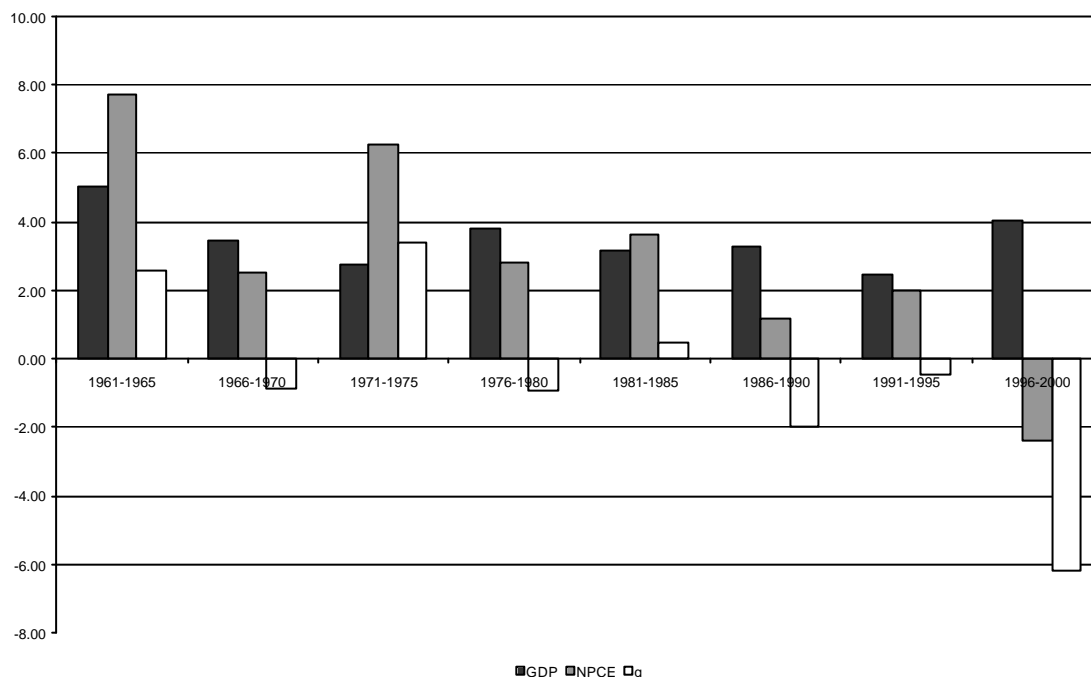
14. We now turn our attention to coefficient q and its components. The relevant data are presented in Table 3: in Part A we find the value of the coefficients and in Part B their growth rates. Coefficient q depends on both sp, the private propensity to save out of YD, and the weight of YD in GDP represented by (1-t). Coefficient sp increased from 20 per cent in 1960 to 23-24 per cent in 1975-85 and decreased thereafter to about 16 per cent in 2000. From Part B of Table 3 it also follows that the dynamic of sp was similar to that of q. An interesting point we discuss in more detail in another place is the fact that g(q) < g(sp) when g(t) > 0. Thus q decreased by 6.2 per cent in 1996-2000 while sp decreased by only 5.3 per cent because in the same period the tax rate increased by 4.8 per cent. In 1971-75 the tax rate decreased by 4.1 per cent, hence q increased by 3.4 per cent while sp by only 2.5 per cent.

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Table 3

Coefficient q and its components
USA, 1960-2000

Part A Structure 1960-2000 (in per cent)

	1960	**1965**	**1970**	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**
q	16.1	18.2	17.4	20.6	19.6	20.1	18.2	17.8	12.9
t	19.7	19.6	19.3	15.7	16.7	14.9	15.2	14.5	18.3
sp	20.0	22.5	21.6	24.4	23.6	23.6	21.5	20.8	15.8
rn	13.7[a]	15.0[a]	12.7	15.1	14.8	16.0	15.4	16.5	16.0
sh	7.3[a]	8.9[a]	10.2	11.0	10.3	9.1	7.2	5.2	-0.2

Part B Growth (1961-2000. in per cent p.a.)

	1961-1965	**1966-1970**	**1971-1975**	**1976-1980**	**1981-1985**	**1986-1990**	**1991-1995**	**1996-2000**
q	2.55	-0.88	3.40	-0.95	0.49	-1.99	-0.43	-6.18
t	-0.58	0.19	-4.07	1.24	-2.32	0.47	-0.96	4.77
sp	2.41	-0.84	2.49	-0.71	0.05	-1.91	-0.60	-5.32
rn*	1.84	-3.24	3.52	-0.48	1.64	-0.77	1.40	-0.60
sh*	3.92	2.79	1.50	-1.19	-2.58	-4.63	-6.33	-25.50[b]

[a] Figures estimated by applying data from the 'Economic Report to the President'. - [b] 1996-1999.
Souce: Ameco Database.

Graph 3

Coefficients q and t
USA, 1960-2000 (in per cent)
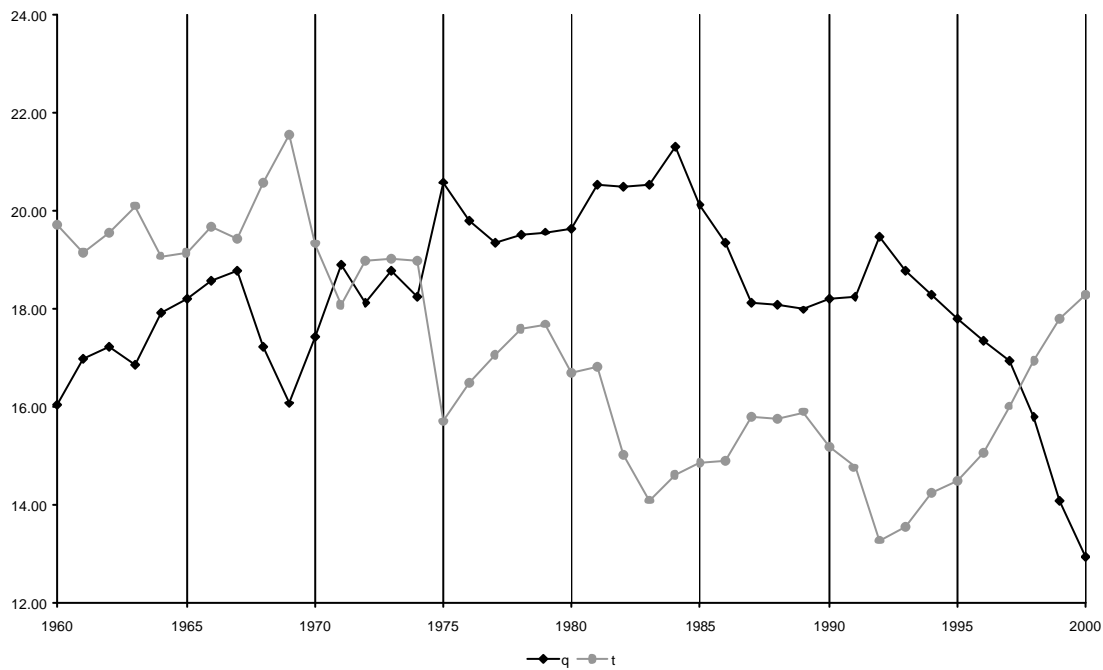
The time profile of q (the private savings ratio in relation to GDP) and t (the proportional tax rate) is shown in Graph 3. In most periods coefficient q is higher than coefficient t except for 1971-75 and 1996-2000 when t was higher than q. In Graph 4 the development of coefficients sp, rn and sh are shown.

Graph 4

Coefficients sp and rn (in relation to YD) and sh (in relation to YDH)
USA, 1960-2000

(in per cent)
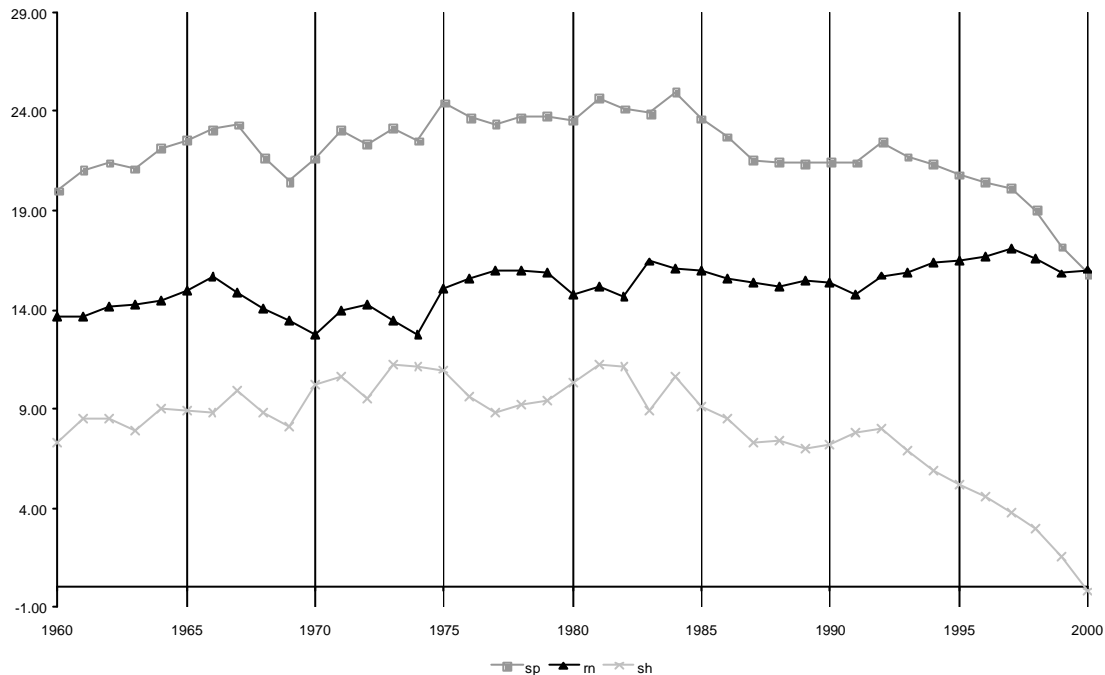
The private propensity to save sp is determined by rn, the share of retained profits (internal savings) in YD and by sh, the share of private households' savings in private households' disposable income YDH. Coefficient rn was about 13 per cent in 1960 and 1970, in all other periods it amounted to 15-16 per cent without any clear tendency towards increasing or decreasing. Indeed, as can be seen from Part B of Table 3, the term g(rn) changes its sign every other period. The growth rate of the propensity to save of private households sh was positive between 1960 and 1975 and negative thereafter: it increased from 7.3 per cent in 1960 to 11 per cent in 1975, then continuously decreased to 5.2 per cent in 1995 and became negative in 2000. The fall of sp between 1975 and 2000 by almost 9 percentage points was thus caused mainly by the fall of sh by more than 11 percentage points. Changes in sh together with those of t constituted also the main factors behind the changes of q, the private propensity to save out of GDP.

15. It is evident that the falling savings ratio has played a decisive role in keeping GDP growth in the USA at a satisfactory level for the past 15 years, and even at a booming level in the past five years. In the second half of the 1990s the average growth rate of NPCE was negative with –2.4 per cent. Nevertheless GDP increased by 4 per cent because coefficient q decreased by 6.2 per cent. The role of the low and falling propensity to save in the booming US economy is not always properly understood. In the 'Economic Report of the President' (2000, p. 71) we read:

> 'Over the last two decades, net domestic investment (gross investment minus capital consumption) has generally exceeded net national saving, and the difference has been made up by foreigners ... Moreover, the share of GDP that was saved had been very low through much of the 1980s and early 1990s.' And further: 'Indeed, if the national saving–GDP ratio were equal today to its levels in those decades, it would suffice to cover domestic investment.'

It is true that the difference between domestic savings (SD) and domestic investment (ID) equals export surplus. From

$$SP = IP + (IG - SG) + E$$

we get

$$SD - ID = E,$$

where

$$SD = SP + SG \text{ and } ID = IP + IG \text{ and}$$

$$E < 0 \text{ when } SD < ID.$$

The real problem is, however, whether the increase in the propensity to save is the proper way to reduce the import surplus if this target is required. The increase in the propensity to save reduces the import surplus in a peculiar way, namely by depressing GDP and the related imports (see Paragraph 8). We illustrate this phenomenon by presenting, in Annex II, two scenarios for 2000 in which we use the exogenous term IP' = IP + G + X as it was in reality. Starting from IP' we determine GDP according to equation (5) by assigning different values to two parameters, namely sp and m; in the year 2000 these parameters amounted to 15.8 per cent and 14.6. per cent, respectively.

We assume *ceteris paribus* that in Scenario A coefficient sp remains at the 1995 level, i.e. 20.8 per cent, and that in Scenario B coefficient m remains at the 1995 level, i.e. 12.3 per cent. In Scenario A, keeping coefficient sp unchanged, i.e. not allowing the propensity to save to decrease between 1995 and 2000, reduces indeed the import surplus. It amounts to only USD 205 billion instead of USD 309 billion in reality. However, the implied GDP would be USD 737 billion (i.e. by 8 per cent) and the implied CP USD 840 billion (i.e. by 15.3 per cent) lower than they were in 2000. It turns out that fighting an import surplus by increasing the propensity to save is indeed a costly method. In Scenario B we suggest to

keep the import propensity in the USA at the initial level of 1995 (probably possible by not allowing an extreme appreciation of the US dollar in the second half of the 1990s). In this scenario the import surplus is being reduced even more, to USD 164 billion, and other results are better as well: both GDP and CP are higher than they were in the year 2000 although the propensity to save as measured by q remains at the very low level of 12.9 per cent.

16. It is quite generally accepted that the private propensity to save depends to a large degree on the distribution of income between wages and profits. For lack of separate data on savings out of wages and out of profits we cannot directly check this proposition. Yet even a simple juxtaposition of the time path of the share of profits and private savings in GDP may be instructive. From Graph 5 we learn that, most of the time, coefficient q has moved at a similar path as the profit ratio. In the first half of the 1990s however the share of profits in GDP increased while coefficient q declined steeply. This means that at least for this period we have to look for other determinants of the private savings ratio.

Graph 5

Profit ratio and coefficient q
USA, 1960-2000
(per cent of GDP)
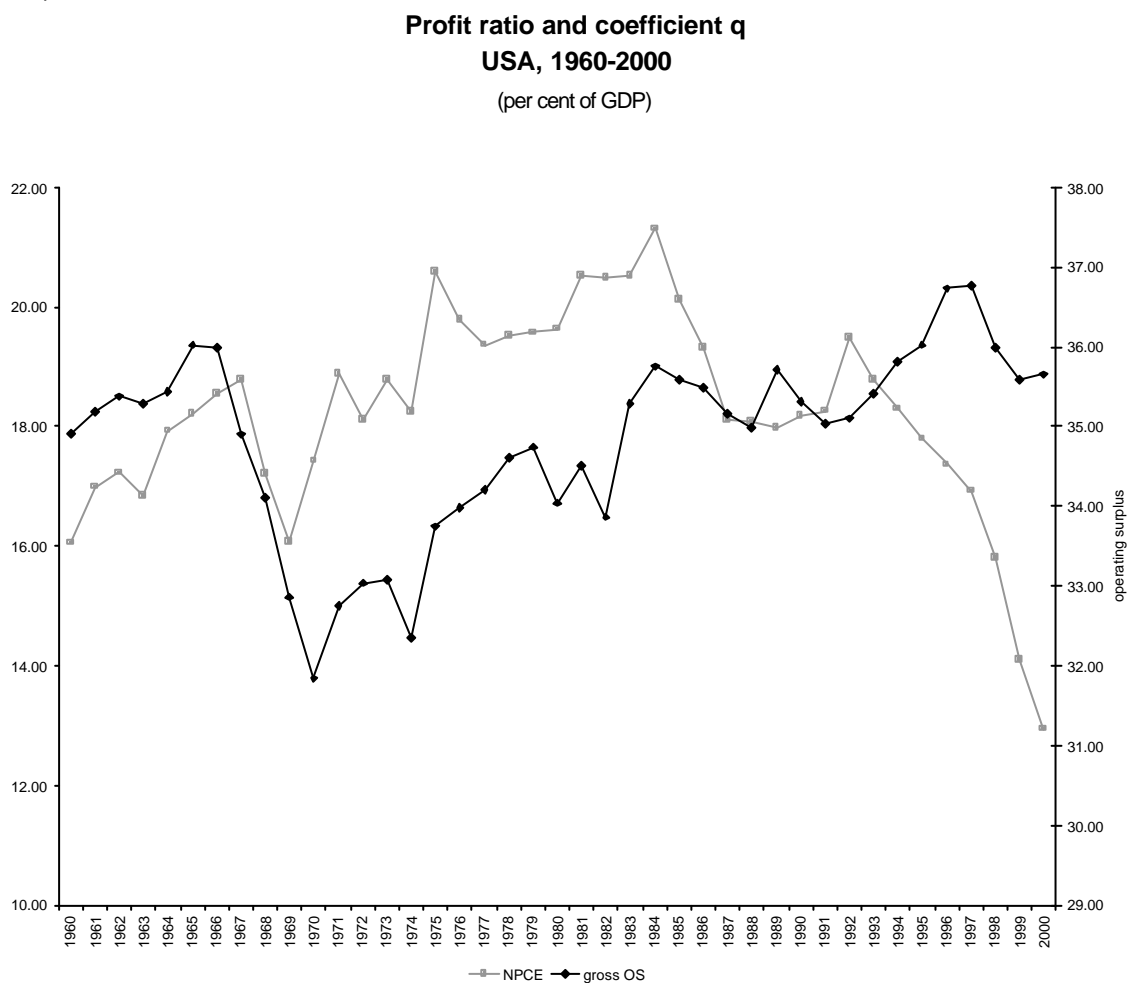
Graph 5 proves that the main factor behind the fall of q was the reduction of sh. To detect the causes of the movement of SH in the USA in 1960-2000 we investigate the influence of two factors, first, of YDH, disposable income of private households, and, second, of WPH, defined as private households' wealth consisting of equity shares at market value. We estimate the following relationship:

$$d(SH/GDP) = a + b_2\, d(YDH)/GDP) + b_3\, d(WPH/GDP) + u$$

where:

SH/GDP   share of private households' savings in GDP;

YDH/GDP   share of disposable income of private households in GDP;

WPH/GDP   wealth of private households, defined as above, in relation to GDP.

The estimation shows a highly significant (at the one per cent level) influence of YDH on household savings, the coefficient of YDH was 0.60. Thus for a change of YDH/GDP of one percentage point (i.e. if this share grows from 72 to 73 per cent), the share SH/GDP, household savings in GDP, is estimated to grow by 0.6 percentage points. The coefficient of WPH is significant at the five per cent level and is indicating a slightly negative relation between wealth and household savings. According to the estimation a rise in the relation WPH/GDP by one percentage point causes the share SH/GDP to decline by 0.02 percentage points (for more details see Annex II)

The direct influence of shares at market value owned by private households on household savings is an important factor because it explains the declining trend of sh as measured in the present study. Wealth, defined as WPH, increased by 10.7 per cent and GDP by 3.2 per cent between 1980 and 1999, hence their relation increased almost fourfold and seems to have been responsible to a high degree for the fall of sp. If this is true, a decline in the WPH/GDP relation in the future can also cause an opposite change of the term sh. If an increase of sh (and in turn of coefficient q) were to occur in the presence of strongly increasing NPCE it would only slow down the growth of GDP. If, however, this increase were to manifest itself in the presence of slightly increasing or stagnating NPCE, it could depress the economy as strongly as the economy was booming when sh declined.

C   GDP growth and the savings ratio in Japan, 1960-2000

17. The growth rates of GDP and NPCE in Japan are presented in Graph 6; it is possible to differentiate the five-year periods for which the growth rates of NPCE are mostly above or mostly below those of GDP. The structure of aggregate demand in Japan in 1960-2000 can be found in Table 4. For most of those years the share of YD in Japan's GDP was

relatively stable, in the range of 85.5 to 87 per cent. In 1990 it was lowest, with 82.1 per cent, and in 2000 highest, with 92.6 per cent. Likewise, the share of CP in GDP moved mostly in a narrow range between 57.1 and 58.9 per cent, yet a certain trend is observable: the share declined from 1960 to 1970 and then increased almost continuously until 2000. The share of collective consumption, amounting to 7.4 to 8.1 per cent until 1970, rose to 9 to 10.3 per cent thereafter. The share of NPCE in GDP increased from 27.1 to 33.3 per cent between 1960 and 1970, decreased to 24.1 per cent in 1990 and increased again to 31.1 per cent in 2000. The development of IP followed *grosso modo* that of NPCE, however, between 1990 and 2000 its share decreased further to 18.6 per cent – an unusually low level for Japan. The budget deficit increased almost continuously from 1960 to 1980, decreased thereafter and even turned into a budget surplus in 1990; between 1990 and 2000 this surplus again turned into an extraordinarily large deficit of over 10 per cent. Except for the year 1980, Japan always registered an export surplus: it was quite large in 1985 (with 3.4 per cent of GDP) and still substantial, considering the size of Japan's economy, in 1995 and 2000.

The growth rates of GDP and its elements are shown in Table 5. In 1961-65 CP and NPCE grew *pari passu* with GDP, at 9.2 to 9.5 per cent. IP increased more slowly and D faster than GDP. In the following five-year period GDP grew by 11.1 per cent with CP growing more slowly and NPCE growing faster than GDP. h this period IP increased very fast, ahead of NPCE and GDP. The conspicuously high dynamics of the Japanese economy in the 1960s was most probably associated with post-war reconstruction and could not be maintained in subsequent years.

Indeed, between 1970 and 1990 GDP growth slowed down to slightly above 4 per cent mostly, and even to 1.3 per cent only in the 1990s. In the 1970s YD increased slightly ahead of GDP with CP increasing faster and NPCE more slowly than YD. In 1971-75 private investment decreased by 1 per cent and the budget deficit exploded by 46.6 per cent. In 1976-80 the main element behind NPCE growth was again IP. In the 1980s the growth of YD remained behind GDP but CP continued to increase faster and NPCE more slowly than YD. In 1981-85 the main factor behind NPCE growth was the export surplus, in 1986-90 private investment.

Graph 6

Growth rates of GDP and NPCE
Japan, 1961-200
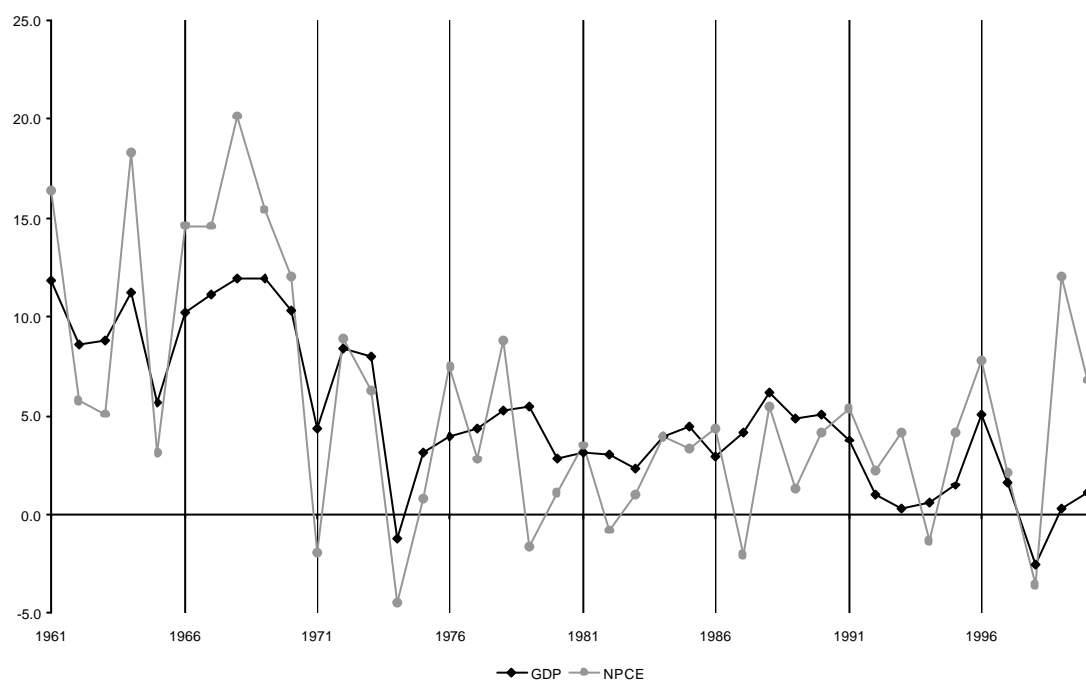
(in per cent)

Table 4

Structure of aggregate demand
Japan, 1960-2000

(in per cent)

	1960	1965	1970	1975	1980	1985	1990	1995	2000
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
T	14.2	13.9	14.5	13.7	13.0	14.5	17.9	14.0	7.4
YD	85.8	86.1	85.5	86.3	87.0	85.5	82.1	86.0	92.6
C	66.7	66.7	59.7	67.2	68.7	68.5	67.0	69.9	71.8
CP	58.7	58.5	52.3	57.1	58.8	58.9	58.0	60.1	61.5
CG	8.0	8.2	7.4	10.0	9.8	9.6	9.0	9.8	10.3
NPCE	27.1	27.6	33.3	29.2	28.2	26.6	24.1	25.9	31.1
IP	25.9	23.4	31.0	23.7	22.7	21.4	25.7	20.0	18.6
D	0.8	2.8	1.0	5.4	6.4	1.8	-2.3	4.4	10.6
E	0.5	1.4	1.3	0.0	-0.9	3.4	0.7	1.5	1.9
SG	6.2	5.7	7.0	3.6	3.2	4.9	8.9	4.2	-2.9
Memorandum GDP (1995 prices), yen billion	74993	116433	197018	245284	303967	358785	449839	483220	509651

GDP growth in the 1990s was disappointing, at 1.4 and 1.2 per cent. Disposable GDP grew much faster than GDP because taxes were reduced dramatically, especially in 1996-2000. Private consumption increased slightly faster than GDP with 2.3 per cent and 1.6 per cent, respectively. On the other hand, NPCE expanded ahead of GDP, especially in 1996-2000, with 4.9 per cent. Private investment however decreased in both five-year periods (especially in 1991-95, by 3.5 per cent); the only item contributing to NPCE growth was the Government budget, up 20.6 per cent in 1996-2000.

Table 5

Average growth rates of real GDP and its components (in per cent p.a.)
Japan, eight five-year periods, 1961-2000

	1961-65	1966-70	1971-75	1976-80	1981-85	1986-90	1991-1995	1996-2000
GDP	9.20	11.09	4.48	4.38	3.37	4.63	1.44	1.07
T	8.73	12.03	3.28	3.33	5.67	9.16	-3.43	-11.04
YD	9.27	10.94	4.68	4.55	3.01	3.78	2.39	2.58
C	9.21	8.65	6.98	4.84	3.32	4.17	2.32	1.59
CP	9.14	8.60	6.36	5.00	3.40	4.29	2.18	1.52
CG	9.68	8.99	10.94	3.91	2.87	3.39	3.16	2.04
NPCE	9.55	15.33	1.79	3.64	2.19	2.60	2.87	4.89
IP	6.99	17.50	-0.95	3.47	2.14	8.58	-3.52	-0.37
Dg	41.47	-9.44	46.58	7.75	-19.29	.	.	20.64
E	36.89	9.19	-47.25	(?) 70.01	48.34	-23.37	17.43	6.48
SG	7.45	15.89	-8.53	1.65	12.84	17.80	-12.72	-16.81

18. In Graph 7 we present the relation between the growth rates of GDP, NPCE and of coefficient q, using equation (6). In the two first and the two last five-year periods coefficient q increased. NPCE increased very quickly in the 1960s and quite moderately in the 1990s, especially in 1991-95. Hence in the 1960s the increase of the private savings ratio q prevented the Japanese economy from overheating, which may have resulted in a constant q and booming NPCE. In the 1990s, in contrast, the growth of the private savings ratio prevented the relatively moderate expansion of NPCE from passing on to GDP growth.

Graph 7

Growth rates of GDP, NPCE and q
Japan, eight five-year periods, 1961-2000

(in per cent p.a.)

GDP □ NPCE □ q
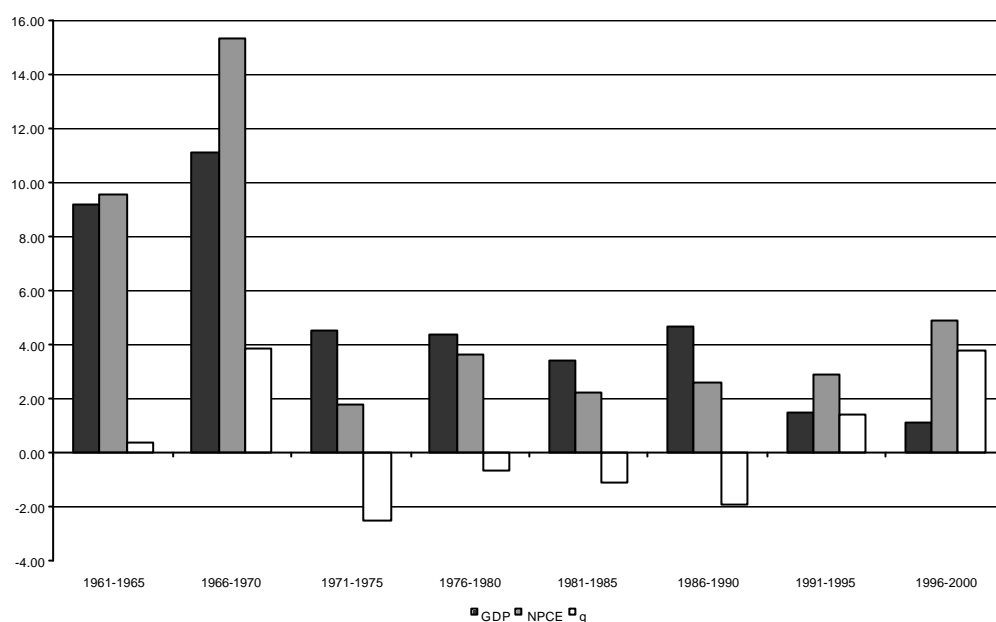
19. Table 6 presents detailed data on the structure and development of coefficient q and its components.

Table 6

Coefficient q and its components
Japan, 1960-2000

Part A Structure 1960-2000 (in per cent)

	1960	1965	1970	1975	1980	1985	1990	1995	2000
q	27.1	27.6	33.3	29.2	28.2	26.6	24.1	25.9	31.2
t	14.2	13.9	14.5	13.7	13.0	14.5	17.9	14.0	7.4
sp	31.6	32.0	38.9	33.8	32.4	31.1	29.4	30.1	33.6
rn	.		26.0	14.2	17.6	18.9	19.5	18.9	20.7[a]
sh	.		17.4	22.9	18.0	15.6	12.3	13.8	12.7[a]

[a]1997

Part B Growth (1961-2000, in per cent p.a.)

	1961-65	1966-70	1971-75	1976-80	1981-85	1986-90	1991-95	1996-2000
q	0.33	3.82	-2.58	-0.71	-1.14	-1.94	1.41	3.78
t	-0.43	0.84	-1.15	-1.01	2.22	4.33	-4.80	-11.99
sp	0.26	3.96	-2.76	-0.86	-0.80	-1.13	0.47	2.25
rn	.	.	-11.44	4.41	0.95	1.16	-0.66	4.65[a]
sh	.	.	5.61	-4.73	-2.84	-4.63	2.40	-4.06[a]

[a]1996-1997

Graph 8

Coefficients q and t
Japan, 1960-2000
(in per cent of GDP)
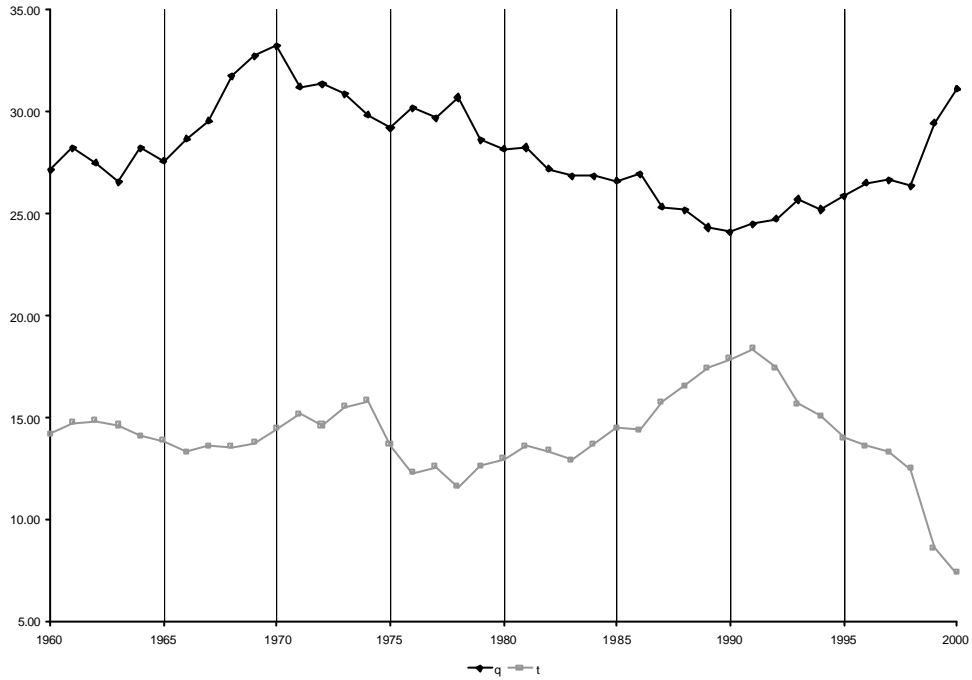
Graph 9

Coefficients sp and rn (in per cent of YD) and sh (in per cent of YDH)
Japan, 1960-2000

In turn we present the time profile of coefficients q and t in Graph 8 and the time profile of coefficients sp, rna and sh in Graph 9. We have already analysed the development of coefficient q. The proportional tax rate t did not change very much until 1985; it moved mostly between 13 and 14 per cent of GDP. However, between 1985 and 1990 it increased to 17.9 per cent, while by 2000 it declined to 7.4 per cent. Over 15 years it increased by over 3 percentage points and decreased thereafter by over 10 percentage points. The private propensity to save out of YD, denoted sp, moved in line with q: an increase from about 32 per cent to about 39 per cent in the 1960s, a decline to about 29 per cent until 1990 and a new increase to about 34 per cent by 2000. Coefficient sp depends on rn and sh, the propensities to save of firms and households. The data available start from 1970 and end with the year 1997. Coefficient sh, the private savings ratio with respect to GDP disposable to private households YDH, increased from about 17 per cent in 1970 to about 23 per cent in 1975 and decreased then to about 13 per cent in 1997, i.e. by remarkable 10 percentage points. Coefficient rn, on the other hand, decreased from 26 per cent in 1970 to about 14 per cent in 1975, i.e. by 12 percentage points, and increased to about 21 per cent in 1997. Pronounced changes in sp, by about 3 percentage points, occurred between 1997 and 2000 (from 30.8 to 33.6 per cent); we do not know, however, to what degree this development was provoked by rn and sh.

20. The depression in Japan of the 1990s has to a large extent been provoked by a sharp increase of coefficient q. This increase was partly due to changes in sp, especially after 1997, but partly also to changes in the proportional tax rate t. From equation (9) we get

$$g(q) - g(sp) = - a_4\, g(t) \qquad\qquad (9')$$

hence the difference between g(q) and g(sp) increases when t decreases. This is an important factor that should be taken account of when the economic situation in Japan in the 1990s is analysed. The private savings ratio sp increased by 1.4 per cent in the 1990s. If the tax rate t remained constant, coefficient q would increase *pari passu* with coefficient sp. In reality the tax rate decreased by 8.5 per cent in the 1990s. Thus coefficient q increased by 2.6 per cent in the same period, i.e. 1.2 percentage point ahead of sp growth. For the period 1996-2000 we have still larger differences: g(q) = 3.8 per cent in the presence of g(sp) = 2.2 per cent and g(t) = -12 per cent; hence the growth rate of q increased by 1.6 percentage points ahead of coefficient sp. The increase in the propensity to save would not have had any greater impact if private investment in Japan had substantially increased. In reality, over the 1990s IP decreased by 2 per cent p.a., and in 1991-96 even by 3.5 per cent p.a. It is therefore understandable that fiscal policy measures were taken in order to stimulate the economy. It is, however, doubtful whether the expansion of the budget deficit by reducing taxes was the proper policy measure. It was probably intended as a way to increase the propensity to consume; in reality it only

increased the propensity to save – with devastating effects for the economy in the presence of the private investment slack.

In the 1990s the Japanese authorities cut the share of taxes in GDP by 17.91 - 7.39 = 10.5 percentage points and increased the share of the budget deficit by (-2.33) - 10.58 = 12.9 percentage points. Let us now assume that a different fiscal policy would have been tried, namely an increase of the budget deficit's share in GDP by increasing Government expenditure at the existing tax rate, and not by cutting taxes. Thus we assume for 1991-95 an increase of G by 9.5 per cent p.a. and for 1996-2000 by another 8 per cent p.a. Based on these figures we calculate G in 1995 and 2000 and, taking into account the real values of IP and X, we get IP' in 1995 and 2000. We also assume that the tax rate remains at the level of 1990 (at 17.9 per cent) and take into account the real coefficients for the import intensity m and the private savings ratio sp from 1995 and 2000. Using then equation (5') we can calculate GDP and all other elements of final demand in 1995 and 2000. The detailed results of this scenario are presented in Annex IV. Here we mention the most interesting results only:

(1)   The share of the budget deficit in GDP in 1995 and 2000 is slightly below the real shares in these years: 4.2 per cent versus 4.4 per cent in 1995 and 10.3 per cent versus 10.6 per cent in 2000.

(2)   The growth rate of GDP in 1991-95 is 2.1 per cent versus 1.4 per cent, in 1996-2000 2.8 per cent versus 1.1 per cent and in the whole 1990s 2.5 per cent versus 1.3 per cent. Thus the scenario growth rate of GDP is twice the real one.

(3)   The growth rate of consumption in the 1990s is 3 per cent in the scenario versus 2 per cent in reality, i.e. also an improvement by more than half.

(4)   The increase of coefficient q in the 1990s, at the same changes in sp as in reality, is restricted to 1.3 per cent instead of the realized 2.6 per cent. Of course, if the private propensity to save sp would have increased much faster than it did in reality, the result of our scenario would be different. But why should the private savings ratio increase more strongly without tax cuts than it did with extremely large tax cuts?

The results of the scenario support the hypothesis that Government spending is a much more efficient way to stimulate the economy than reducing taxes. Perhaps the Japanese economy would have been in a much better shape in the 1990s if exactly this method had been realized instead of mostly cutting taxes. The reduction of taxes in Japan seems to have been an important mistake. It was meant to be a fiscal incentive but proved to be a fiscal disincentive. Given the increase of sp, it would have been preferable to keep the existing tax rate and to increase Government expenditure. In the USA sp decreased, and the increasing tax rate t strengthened this tendency; this kept the GDP growth rate high at very low growth rates of NPCE. In Japan sp increased, and decreasing t strengthened the

rise of q above that of sp. Although the NPCE growth rate was quite high, supported by the expansive fiscal policy, the resulting GDP growth was disappointing.

21. As already mentioned the increase of sp played also a significant role in the slowing-down of GDP growth in the 1990s. In Graph 10 we juxtapose the profit share and coefficient q in Japan. Between 1970 and 1990 the two curves moved along a similar path, but before 1970 and especially in the first half of the 1990s this was not the case.

Between 1990 and 2000 coefficient sp increased from 29.4 to 33.6 per cent, i.e. by over 4 percentage points. The changes in sp and of the factors behind these changes, especially after 1997, require further research.

Graph 10

Profit share and coefficient q
Japan, 1960-2000
(in per cent of GDP)

D   Some final remarks

22. We have seen that spendthrift supports growth in the USA while thrift creates an impediment to growth in Japan. These results are possible because the degree of utilization of capacity in a capitalist economy can and does change in a significant way. Let

us have once more a look at the factors determining macroeconomically the changes in u, the coefficient measuring the degree of capacity utilization. We had

$$u = (I/K)(s/v) \qquad (11)$$

if a closed economy without a state is assumed (hence NPCE = I and q = s, where I and s denote investment and the savings ratio, respectively). Taking the logarithmic derivatives after time we get

$$g(u) = [g(I) - g(K)] - [(g(s) - g(v)] \qquad (11')$$

Steady state growth means $g(u) = 0$ because investment I and capital K increase at the same rate $g(I) = g(K)$ while $g(s) = g(v) = 0$. The concept of steady state growth may be a useful abstraction if it serves as a reference model to reality. Let us start with the term $[g(I) - g(K)]$; it compares the growth rate of effective demand, governed by I, with the growth rate of potential supply, governed by K. If the growth rate of investment $g(I)$ is constant for a certain time N (where N is at least equal to the life span of the average investment vintage) then at least at that time the growth of capital $g(K)$ would equal $g(I)$. If now the growth rate of investment increases to $g'(I)$, $g'(I) > g(I)$, and stays at this level for the time N, the growth rate of capital $g(K)$ would continuously increase to reach in the end the value $g'(I)$ from below. Hence, during the transition from a growth rate g to $g' > g$, the sign of the term $[g(I) - g(K)]$ would be positive. Vice versa, when $g''(I) < g(I)$ at the beginning the growth rate of capital would continuously decrease to reach in the end the value $g''(I)$ from above. Hence, during the transition from a growth rate g to a growth rate $g'' < g$, the value of the term $[g(I) - g(K)]$ would be negative. These changes are not so difficult to understand if one is reminded that I is a flow while K is a stock, hence the changes in stock K consisting of N flows (of investment vintages) follow with a time lag the changes in I.

The choice of the capital output ratio v plays a major role in mainstream economics. It is driven by the production factor prices and assures their full employment if only market forces are free to function. When the economy moves from one steady state to another (e.g. with a higher s) it is being assumed that the relation of s/v does not change – at least in the long run – because $g(v)$ adjust itself to $g(s)$. It should be stressed that this construction rests on a shaky theoretical foundation – the correspondence between production factor prices and their marginal productivities. The 'Cambridge Discussion' has proved the irrelevance of changes in input proportions and thus of the whole concept of traditional substitution between capital and labour. 'More specifically the *direction of change* of the input proportions is ... something that cannot be related unambiguously to the changes of prices' (Pasinetti, pp. 168-169). We therefore completely disregard here the changes of v and treat the term $g(v)$ as an exogenous variable determined decisively by

technical progress. Of course changes in v, if they materialized, would influence our conclusions but we simply do not know in which direction they may go.

We rewrite (11') correspondingly as

$$g(u) = [g(I) - g(K)] - g(s) \tag{11''}$$

and move to the variable s which has stayed in the focus of attention in this paper. The propensity to save s changes in a way that is difficult to predict. We therefore analyse the consequences of a decreasing and increasing s. Let us assume that g(I) and g(K) remain unchanged (as far as they depend on possibilities offered by technical and organizational inventions) but g(s) < 0; thus g(u) > 0 , hence the utilization of capacity increases because at given investment and capital growth the consumption growth accelerates. If on the other hand g(s) > 0, *ceteris paribus* consumption growth decelerates and the utilization of capacity declines. This is the most important way in which changes in s are transmitted to changes in GDP growth, as observed in the USA and Japan.

In the USA the process of declining propensity to save started in the five-year period 1981-85 when it amounted to about 23 per cent. The continuing fall of the propensity to save g(s) < 0 after 1981-85 and the related increase in consumption first influenced the utilization of capacity u and, in turn, investment growth – after a prolonged period of investment stagnation in most of the 1980s and at the start of the 1990s. If g(I) increases after a period of stagnation or lower growth, we have g(I) > g(K), hence the term [g(I) - g(K)] is for some time positive although declining. For quite a while this term additionally influences the increase of u. We can observe a kind of cumulative movement started by the fall of the savings ratio and supported by the increasing growth rate of investment. Can this process be continued indefinitely? Certainly not, because u cannot cross the upper value of 1. When u = 1 we are back in the scarcity world and any increase in the consumption share (the decrease of s) happens at the expense of the investment share. Hence g(I) has to decline, as has the demand-determined GDP. With g(I) falling the sign of the term [g(I) - g(K)] becomes negative because g(K) reacts more weakly and with some delay to changes in g(I). Even at given s the utilization of capacity starts to decline and influences further investment decisions negatively. This process intensifies if after a prolonged period of declining s this coefficient starts to increase.

In Japan in the 1970s and 1980s the development seems to have been *grosso modo* similar to that in the USA. In the 1990s, however, the picture changes completely. The propensity to save increases and this factor *per se* leads to a slowing-down of consumption and GDP growth, hence to a declining degree of capacity utilization. Lower u has a negative influence on investment decisions and investment growth becomes negative over the 1990s. It is quite possible that factors other than the changes in u are

also or even mostly responsible for the turn in investment growth. In addition the term [g(I) - g(K)] declines much more than |g(I)| = -g(I) because the term g(K) remains positive for quite a while even if new investment vintages decline. This happens when gross investment is higher than reinvestment – as is usually the case in a growing economy – and when the sign before g(I) changes from plus to minus. Indeed declining investment would still increase K because the new investment vintage is still higher that the one that is being scrapped. Only when gross investment becomes lower than the oldest investment vintage, the capital stock would start to decrease. Hence coefficient u is negatively influenced by all three factors in equation (11"). Sooner or later this decline in u has to be stopped although – contrary to the previous case – there exists no clear lower limit to changes in u. Declining investment would sooner or later lead to declining K, hence declining actual GDP would be confronted with declining potential output and coefficient u cannot fall indefinitely. The increase of u may be started e.g. by a constancy of s and I because a stagnating GDP would be confronted with a falling potential GDP.

IV   Conclusions

If we treat private investment, budget deficit and export surplus as one item we can say that there are two factors which determine the size and the dynamics of GDP: the term NPCE (= IP + D + E) and coefficient q or – if we take the real exogenous term IP' (= IP + G + X) – coefficients sp, t and m. We have found that, given sp the private savings ratio in relation to YD, coefficient q is the smaller the higher the average (and marginal) tax rate t. This means that if an increase of t does not influence sp it decreases q = (1 - t)sp. If in addition sp declines the decline of q is still stronger. Thus a tax policy consisting in an increase of t would *ceteris paribus* act expansively, which is in contrast to the orthodox assumption that such a tax policy would act restrictively. It is true that the latter view concentrates rather on the negative influence of higher taxation upon investment decisions, hence NPCE (or NP'), but we have seen that higher taxes does not necessarily mean lower private investment. Another orthodox assumption, namely that a decrease of t would *ceteris paribus* act expansively, is not necessarily working either. If, given sp, the tax rate decreases, the coefficient q increases; *ceteris paribus* this factor would restrict the level of economic activity. Also in this case the expected positive influence upon investment decisions and private investment does not necessarily materialize. It is possible that a private investment decline in the presence of extraordinary tax cuts and the increasing propensity to save may put the economy in a deep recession.

We have seen that the share of profits in GDP positively influences coefficient q. As far as coefficient sh is concerned we have found – in the USA – that the market value of shares negatively influences this propensity to save. Thus if the business climate is good and the stock market booms, the propensity to save diminishes and GDP grows stronger than does NPCE. This cumulative movement may come to a halt and reverse once the

business climate deteriorates. When the market value of shares falls the propensity to save will most probably increases and the lower growth or even decline of private investment might be strengthened and transmitted to GDP. Here also a cumulative movement may materialize but going in a direction opposite to the previous one.

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ANNEX I

Table I.1

Structure of aggregate demand
USA, average for eight five-year periods 1961-2000

(in per cent)

	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
T	19.4	20.1	18.1	17.1	15.1	15.5	14.1	16.9
YD	80.6	79.9	81.9	82.9	84.9	84.5	85.9	83.1
C	80.3	80.6	80.6	80.0	81.6	83.3	83.4	82.1
Cp	63.2	62.3	62.9	63.3	64.3	66.2	67.4	67.8
Cg	17.2	18.3	17.7	16.7	17.3	17.1	16.0	14.3
NPCE	17.5	17.6	18.9	19.6	20.6	18.3	18.5	15.3
GCFp	15.6	15.8	16.4	18.0	17.4	16.1	14.7	17.2
Dg	1.3	1.7	2.6	2.4	4.8	4.3	4.7	0.2
E	0.6	0.0	0.0	-0.8	-1.6	-2.1	-0.8	-2.1
Sp	21.7	22.0	23.1	23.6	24.2	21.7	21.5	18.4
Sg	2.2	1.8	0.5	0.4	-2.2	-1.6	-2.0	2.5
Sh	5.9	6.3	7.5	6.6	7.3	5.3	4.9	1.7
Rn	11.6	11.3	11.4	12.9	13.3	13.0	13.7	13.6
Memorandum item GDP (in 1995 prices) USD billion	2602.30	3295.86	3828.60	4513.14	5097.24	6145.68	6906.04	8290.00

Table I.2

Average growth rates of real GDP and its components (in per cent p.a.)
USA, seven five-year periods 1961-2000

	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000
GDP		4.84	3.04	3.34	2.46	3.81	2.36	3.72
T		5.61	0.93	2.15	-0.12	4.42	0.39	7.57
YD		4.65	3.55	3.60	2.97	3.70	2.71	3.03
C		4.92	3.03	3.18	2.88	4.24	2.39	3.39
Cp		4.57	3.24	3.46	2.79	4.41	2.74	3.83
Cg		6.18	2.31	2.17	3.21	3.63	0.99	1.45
NPCE		4.95	4.58	4.04	3.51	1.42	2.57	-0.11
GCFp		5.18	3.74	5.33	1.81	2.22	0.42	7.10
Dg		10.48	12.15	1.40	18.08	1.65	4.02	-44.46
E		-36.62	-199.33	87.74	18.50	9.41	-15.15	24.54
Sp		5.14	4.07	3.79	3.00	1.52	2.22	0.53
Sg		0.71	-20.91	1.59	-241.44	-2.49	6.15	-209.32
Sh		6.12	6.85	0.74	4.31	-2.49	0.56	-15.88
Rn		4.34	3.23	6.02	3.09	3.31	3.34	3.69
q		0.19	1.45	0.68	1.02	-2.29	0.20	-3.59

In Graph I.1 we present the relation between g(GDP), g(NPCE) and g(q) for the five-year periods taken as a whole. It turns out that the results are very similar to those achieved by an analysis taking into account the development within each of the five-year periods. In these cases: 1966/70 (compared to 1961/65), 1976/80 (compared to 1971/75) and 1991/95 (compared to 1991-95), the sign of change of coefficient q is opposite to those in Graph 2 in the main text. This is so because changes for the sub-periods are relatively small. If we take the averages for ten years: the 1960s, 1970s, 1980s and 1990s, the picture is exactly the same: an increase of q until about 1980-85 and a decrease of q thereafter.

Graph I.1

Growth rates of g(GDP), g(NPCE) and g(q)
USA, seven five-year periods 1961-2000
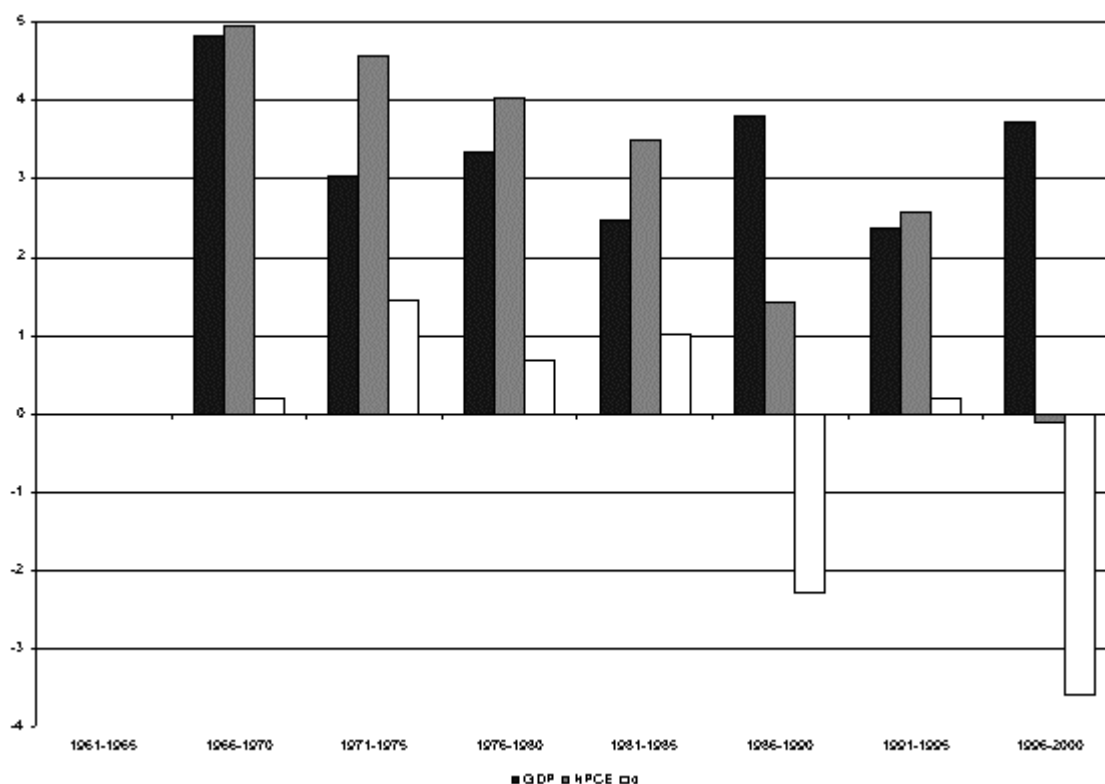
(in per cent)

ANNEX II

Table II.1

Two scenarios of the US economy in 2000:
Scenario A: coefficient sp = 20.8 per cent
Scenario B: coefficient m = 12.3 per cent

	1995	2000	SCENARIO A 2000 estim.	SCENARIO B 2000 estim
GDP	7337,5	8948,423	8211,805	9416,853
T	1062,6	1635,81	1502,760	1723,284
YD	6274,9	7312,613	6709,044	7693,569
C	6079,6	7418,501	6578,533	7742,957
CP	4969	6153,529	5313,563	6477,985
CG	1110,6	1264,972	1264,970	1264,972
NPCE	1306,1	1157,888	1395,481	1215,584
IP	1143,7	1588,765	1588,765	1588,765
D	246,6	-121,434	11,640	-208,908
E	-84,2	-309,443	-204,923	-164,273
SG	-48	372,034	237,790	458,312
SD	1258,1	1529,921	1633,272	1673,896
G	1309,2	1514,376	1514,400	1514,376
X	818,6	994	994,000	994,000
IP'	3271,5	4097,141	4097,165	4097,141
M	902,8	1303,469	1198,923	1158,273
D/GDP	0,034	-0,014	0,001	-0,022
E/GDP	-0,011	-0,035	-0,025	-0,017
q	0,178	0,129	0,170	0,129
sp	0,208	0,158	**0,208**	0,158
t	0,145	0,183	0,183	0,183
m	0,123	0,146	0,146	**0,123**
g(GDP)		4,0	2,3	5,1
g(NPCE)		-2,4	1,3	-1,4
g(q)		-6,2	-0,9	-6,2
g(CP)		4,4	1,3	5,4

ANNEX III

Dependent Variable: D(SH)
Method: Least Squares
Sample (adjusted): 1961 1999
Included observations: 39 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(YDH)	0.595790	0.098879	6.025475	0.0000
D(WPH)	-0.015255	0.007332	-2.080592	0.0446
C	-0.069549	0.084283	-0.825187	0.4147

R-squared	0.532694		
Adjusted R-squared	0.506732	Mean dependent var	-0.102038
S.E. of regression	0.518218	S.D. dependent var	0.737855
Sum squared resid	9.667778	F-statistic	20.51864
Durbin-Watson stat	2.090226	Prob(F-statistic)	0.000001

Technical notes

The above estimation gave a fairly reasonable R2 and adjusted R2 of 0.53 and 0.5.

The Jarque-Bera test statistic for the normality of the residuals gave a value of 0.07 and a probability value of 0.96, thus the residuals could safely be assumed to be normally distributed.

The value of the Durbin-Watson statistic of around 2 and the probability value of the Breusch-Godfrey asymptotic test up to the second order of 0.47 did not reject the hypothesis of no serial correlation. The performance of a White test (with cross terms) for heteroscedasticity very clearly points to homoscedastic disturbances (P-value of 0.87). The Ramsey RESET test for misspecification has a P-value of 0.37, so there is no indication of misspecification of our equation. Only the Chow forecast test for one year gave negative results, thus rejecting the hypothesis of constant parameters. However, this last result is quite understandable in the light of the drastic changes in the saving behaviour of households in the 1990s; this was also confirmed by a re-estimation of our equation for the last 15 years, where the Chow forecast test performed much better.

Thus, after all, the specified equation has survived a whole battery of tests in a very satisfying way, and since also the a re-estimation of the equation with a different data set (taken from the Economic Report to the president) gave very similar results, we may conclude that the derived results are very conclusive for our purposes.

The original idea of our estimation exercise was to directly relate, without any transformation, household savings (SH) to disposable income of private households (YDH) and wealth (WPH). However, our time series were clearly non-stationary (as are most economic time series), thus inducing the danger of spurious regression results to a regression of SH on YDH and WPH. Indeed in carrying out this regression we got a very high R-squared 0.83 combined with a very low Durbin-Watson statistic (0.85), which is an indication for a spurious regression.

The exploitation of the possibility of a cointegrating relationship between those variables was not successful, since cointegration requires the variables to be each integrated of the order one – I(1); however, an Augmented Dickey-Fuller test showed that at least WPH is I(2) and probably SH, too (SH was I(1) only at a 10 per cent level), so that we would have had to take first differences of WPH and SH. Since this would have rendered any interpretation of estimation results awkward, we refrained from going any further in this direction and chose to use an alternative specification instead.

As an alternative we divided our variables by GDP, i.e. we took their shares in GDP. Although this procedure did not solve the problem of non-stationarity completely, all variables were now at least I(1), which allowed us to check for cointegration rather easily. Thus firstly we applied the Engle-Granger procedure by regressing SH on YDH and WPH (and an intercept) – each as a share of GDP. After taking the residuals from this regression and making them subject to a unit-root test, we found that these residuals were I(0), which is one indicator for a cointegration relationship between our variables. As a second step we fitted an ADL (autoregressive distributed lag) model to the data to derive an additional test for cointegration. Thus we regressed SH on the exogenous variables as well as on the lagged exogenous and endogenous variables. After that we checked whether the sums of the coefficients of each variable is significantly different from zero, i.e. we tested whether the coefficient of a variable plus the coefficient of its lagged value gave zero or not. Unfortunately this method rejected the hypothesis of a cointegrating relationship, which made it necessary to apply a different model once again. Since all our variables were I(1) the easiest way was to simply take first differences of the variables, which finally led to the chosen estimation model.

ANNEX IV

Table IV.1

Structure of aggregate demand
Japan, average for eight five-year periods 1961-2000

(in per cent)

	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
T	14.4	13.8	15.0	12.4	13.6	16.5	16.1	11.1
YD	85.6	86.2	85.0	87.6	86.4	83.5	83.9	88.9
C	66.0	62.3	63.3	67.9	69.1	67.6	68.1	70.9
Cp	58.0	54.7	54.6	58.1	59.2	58.4	58.7	60.9
Cg	8.0	7.5	8.7	9.8	9.8	9.2	9.4	10.0
NPCE	27.6	31.5	30.5	29.4	27.1	25.1	25.2	28.0
GCFp	25.7	28.3	26.6	22.2	20.8	23.5	22.0	19.7
Dg	2.0	2.0	3.0	6.8	4.4	-0.6	1.3	6.9
E	-0.1	1.2	0.8	0.4	1.9	2.2	1.9	1.4
Sp	32.3	36.5	35.8	33.6	31.4	30.1	30.1	31.5
Sg	6.4	6.3	6.2	2.7	3.8	7.2	6.7	1.1
Sh	.	13.5	14.3	14.9	11.7	9.1	9.1	9.1
Rn	.	27.2	16.2	14.6	15.4	16.1	16.1	17.7
Memorandum item								
GDP (in 995 prices) yen billion	100138	161240	230546	280227	333985	407993	474243	507976

Table IV.2

Average growth rates of real GDP and its components (in per cent p.a.)
Japan, seven five-year periods 1961-2000

	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000
GDP		10.00	7.41	3.98	3.57	4.08	3.06	1.38
T		9.07	9.16	0.22	5.48	8.14	2.54	-5.89
YD		10.15	7.12	4.59	3.29	3.38	3.16	2.56
C		8.72	7.77	5.44	3.93	3.65	3.20	2.21
Cp		8.73	7.35	5.30	3.97	3.78	3.17	2.13
Cg		8.63	10.68	6.30	3.68	2.84	3.39	2.71
NPCE		12.90	6.72	3.27	1.90	2.50	3.12	3.56
GCFp		12.15	6.11	0.30	2.22	6.67	1.64	-0.83
Dg		9.33	16.98	22.05	-5.10	-170.47	-219.35	41.68
E		-275.55	-0.70	-8.44	40.53	6.92	0.44	-4.51
Sp		12.75	7.01	2.66	2.18	3.19	3.03	2.34
Sg		9.61	7.22	-12.19	11.22	18.41	1.41	-29.92
Sh	.		8.64	4.81	-1.23	-1.09	3.09	1.41
Rn	.		-3.14	1.83	4.73	4.92	3.15	3.28
q		2.47	-0.45	-0.68	-1.63	-1.49	0.01	2.15

Graph IV.1

The growth rates g(GDP), g(NPCE) and g(q),
Japan, seven five-year periods 1961-2000

(in per cent)
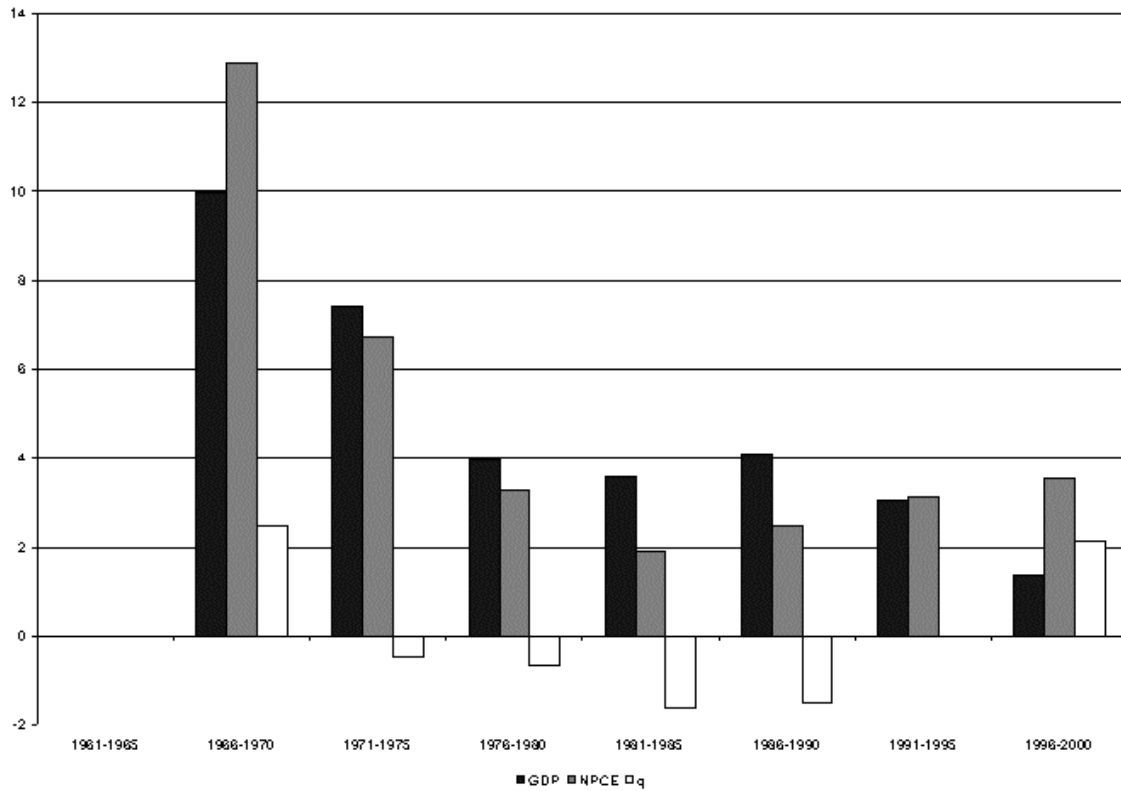
In Graph IV.1 we compare each five-year period with the preceding one in order to check the results observed in Graph 6. Only in one period, 1991-95, we get different results: from 1991 to 1995 coefficient q declined, hence GDP grew more slowly than NPCE; however, the average coefficient q in 1991/96 was equal to the one in 1986-90, hence GDP and NPCE calculated as five-year averages increased *pari passu*. As a whole the conclusion is the same: coefficient q increases in the 1960s, declines between 1970 and 1990, and increases in the 1990s.

Annex V

Table V.1   **Real development, Japan 1990-2000, and Scenario 1995 and 2000**

	Real de velopment 1990-2000			Scenario 1995-2000		real			scenario		
	1990	1995	2000	*1995*	*2000*	real 91-95 growth rate	real 96-00 growth rate	real 91-00 growth rate	*sc. 91-95 growth rate*	*sc. 96-00 growth rate*	*sc. 91-00 growth rate*
GDP	449839	483220	509651	499638	574015	1.44	1.07	1.26	2.12	2.81	2.47
T	80548	67655	37688	89465	102783	-3.43	-11.04	-7.31	2.12	2.81	2.47
YD=GDP-T	369291	415566	471963	410173	471233	2.39	2.58	2.48	2.12	2.81	2.47
C	301359	337942	365739	345632	405686	2.32	1.59	1.96	2.78	3.26	3.02
CP	260766	290524	313274	286711	312899	2.18	1.52	1.85	1.92	1.76	1.84
CG	40593	47419	52465	58921	92788	3.16	2.04	2.60	7.74	9.51	8.62
GCF	145292	138157	134214	142138	158206	-1.00	-0.58	-0.79	-0.44	2.17	0.86
IP	115825	96815	95049	96815	95049	-3.52	-0.37	-1.96	-3.52	-0.37	-1.96
IG	29467	41343	39165	51371	69267	7.01	-1.08	2.89	11.76	6.16	8.92
IG/G	0.42	0.47	0.43	0.47	0.43	2.06	-1.70	0.16	2.06	-1.70	0.16
G=CG+IG	70060	88761	91630	110292	162055	4.85	0.64	2.72	**9.50**	**8.00**	8.75
D	-10487	21107	53943	20827	59272						
SG	39955	20236	-14777	30544	9995	-12.72			-5.23	-20.02	-12.94
NPCE	108526	125042	158740	123462	158334	2.87	4.89	3.88	2.61	5.10	3.85
IP'	233919	230969	241809	252499	312233	-0.25	0.92	0.33	1.54	4.34	2.93
q =sp(1-t)	0.241	0.259	0.311	0.247	0.276	1.41	3.78	2.59	0.48	2.22	1.35
t=T/GDP	0.179	0.140	0.074	0.179	0.179	-4.80	-11.99	-8.46	0.00	0.00	0.00
m=M/GDP	0.100	0.079	0.089	0.079	0.089	-4.50	2.37	-1.12	-4.50	2.37	-1.12
q+t+m	0.520	0.478	0.474	0.505	0.544	-1.67	-0.15	-0.91	-0.57	1.48	0.45
sp=NPCE/YD	0.294	0.301	0.336	0.301	0.336	0.47	2.25	1.36	0.48	2.22	1.35
X	48034	45393	55130	45393	55130	-1.12	3.96	1.39	-1.12	3.96	1.39
M	44846	38272	45385	39572	51116	-3.12	3.47	0.12	-2.47	5.25	1.32
E	3188	7121	9749	5821	4014	17.43	6.48	11.82	12.79	-7.16	2.33
E/GDP	0.71	1.47	1.91	1.16	0.70						
D/GDP in %	-2.33	4.37	10.58	4.17	10.33						

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