Suggestions for a New Set of Fiscal Indicators

Olivier Jean Blanchard

OECD

OECD

DEPARTMENT
OF ECONOMICS AND STATISTICS
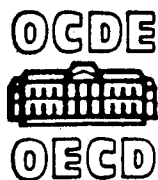
WORKING PAPERS

No. 79   SUGGESTIONS FOR A NEW SET OF FISCAL INDICATORS

by

Olivier Jean Blanchard

Massachusetts Institute of Technology
National Bureau of Economic Research

April 1990

OCDE

OECD

ECONOMICS AND STATISTICS DEPARTMENT

WORKING PAPERS

This series of Working Papers is designed to
make available, to a wider readership,
selected studies which the Department has
prepared for use within OECD. Authorship is
generally collective, but main individual
authors are named. The Papers are generally
available in their original language,
English or French, with a summary in the
other.

Comment on the Papers is invited, and may be
sent to OECD, Department of Economics and
Statistics, 2 rue André Pascal, 75775 Paris
Cedex 16, France. Additional copies of the
Papers on a limited basis can be forwarded
on request.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

26531

There are four sets of questions that fiscal indicators can help answer: (1) Of the changes in the fiscal position, what part is due to changes in the economic environment and what part is due to policy? (2) Can the current course of fiscal policy be sustained, or will the government have to adjust taxes or spending? (3) What is the effect of fiscal policy on activity, through its effects on relative prices, be it the price of labour or the price of capital? (4) What is the macroeconomic impact of fiscal policy, through deficit and debt finance?

This paper is one of three in this Working Paper Series, along with those by Chouraqui et al. and Gramlich, in which the assessment of fiscal policy is reconsidered. It argues that no single indicator can give even rough answers to all those questions. It then develops four (sets of) indicators, aimed at answering each of the questions.

Les indicateurs de politique budgétaire sont susceptibles d'apporter des éléments de réponse à quatre séries de questions : (1) Quelle part doit-on attribuer respectivement à l'environnement économique et aux mesures dites "discrétionnaires" dans les variations observées du solde budgétaire ? (2) La politique budgétaire dans sa forme actuelle peut-elle être poursuivie, ou bien les autorités devront-elles procéder à un réajustement des recettes fiscales ou des dépenses publiques ? (3) Quel impact la politique budgétaire exerce-t-elle sur l'activité, par le biais de ses effets sur les prix relatifs, tant du travail que du capital ? (4) Dans quelle mesure le déficit et le financement de la dette publique affectent-ils l'impact de la politique budgétaire ?

L'étude qui suit fait partie intégrante de trois contributions sur les méthodes d'évaluation des politiques budgétaires, publiées dans cette série des Documents de Travail de l'OCDE; les deux autres contributions, de Chouraqui et al. et de Gramlich, sont diffusées séparément. Cette étude repose sur l'hypothèse qu'un indicateur unique ne peut pas permettre de répondre, même grossièrement, à toutes ces questions. Aussi suggère-t-il quatre catégories d'indicateurs visant à apporter une réponse à chacune d'entre elles.

SUGGESTIONS FOR A NEW SET OF FISCAL INDICATORS

by

Olivier Jean Blanchard*

CONTENTS

INTRODUCTION

For a number of years, the OECD has relied on the cyclically adjusted budget balance (CAB) as an indicator of fiscal policy. In response to growing dissatisfaction with the index on the part of some member countries, the OECD now publishes changes in the CAB rather than the level of the CAB itself. This is, however, an inadequate response to more fundamental problems with the index.

First, the underlying assumptions about the nature of the cycle, namely that there are regular fluctuations around a slowly changing trend, have become increasingly challenged. In the United States, a more formal econometric look at output movements has suggested that there was little tendency for the economy to return to any stable underlying trend (1). More directly relevant, the history of European unemployment since the early '70s has led many -- and should lead anyone -- to question the idea that unemployment oscillates around some stable, or slowly changing, value.

Second, and more important, the CAB is used for too many purposes. The CAB, or its antecedent, the full employment surplus, was conceived to answer a simple question, but has become over time a jack-of-all-trades. The original purpose of the full employment surplus was to tell what the deficit would be, were the economy at full employment (2). In an extension of that original question, the CAB is used as an index of discretionary changes in fiscal policy, of those changes which are due to policy rather than to the economic environment. But it is also used for many other purposes. It is used as a measure of sustainability of fiscal policy, as an indicator of whether the current fiscal policy is viable or will need major readjustments in the future. It is used as a measure of the effects of fiscal policy on aggregate demand or saving. Finally it is used as a normative index, with the implication that a constant CAB is desirable for short-run stabilisation, for long-run stability, or both. The CAB was not 'designed to do those tasks, and the answers it provides are often incomplete and sometimes misleading.

Even if the CAB cannot give all the answers, the questions asked are still the right ones. Is the current policy sustainable? What is the contribution of fiscal policy to demand, to supply, to saving? Do changes in the fiscal position come from changes in the economic environment or from changes in policy? This suggests a simple overhaul strategy, that of taking each set of questions on its own, and coming up with not one, but with a battery of indicators. This is the approach I follow in this report.

The report has six sections. Section I reviews the uses of the CAB and discusses, in each case, the pros and cons of using the CAB. Section II discusses the basic principles which should guide the choice of new indicators. The following sections present four sets of indicators. Section III formulates indicators of discretionary changes in fiscal policy. Section IV develops indicators of sustainability. Sections V and VI focus on the effects of fiscal policy on the economy: Section V derives indicators of fiscal impact on aggregate demand and saving while Section VI deals with indicators of fiscal distortions. The conclusion and summary complete the report.

I. THE USES AND ABUSES OF THE CAB

This section has two purposes. The first one is to distinguish clearly between the different questions for which the CAB is used. The second is to assess the deficiencies of the CAB when used to answer each particular question. The purpose is not to flay a dead horse. No simple and single indicator can answer many complex questions, and for many purposes, the CAB is a remarkably simple and useful indicator. It is to identify the questions, and start thinking about the characteristics of the ideal indicator in each case.

A.   The CAB as an index of discretionary changes in fiscal policy

The CAB is used to answer the following question: "Of the changes in the fiscal position (taxes, transfers, spending), what part is due to changes in the economic environment and what part is due to changes in policy?" Quite apart from the effect of fiscal policy on the economy, this is a useful question to answer. It tells us whether a government has taken active steps to decrease spending, to increase taxes and so on. While the major changes in policy can be monitored directly, the answer to the question provides quantitative estimates, and can detect the total effects of the smaller changes in policy.

The CAB gives however an incomplete and needlessly controversial answer to that question. i) The answer is incomplete. Given the question, there is no reason to focus on output/unemployment changes and exclude changes in inflation and real interest rates. ii) The answer is needlessly controversial.

By using a mid-cycle adjustment, the CAB tackles issues about the nature of macroeconomic fluctuations which are difficult, very controversial and, more importantly, completely irrelevant for the question at hand. By constructing a trend in whichever way, it takes a position on the issues of whether there are cycles around a stable trend, of whether the economy will return to lower unemployment and so on.

The debate on the nature of fluctuations is a heated one. But, for the question at hand, there is no need whatsoever to plunge into it: if all that is needed is to distinguish between induced and discretionary fiscal policy changes, any benchmark will do. For example, induced changes in fiscal policy can be defined as those changes which come from changes in inflation, interest rates and output growth over the previous year -- or over the previous 10 year average -- values. How to choose the benchmark is still a relevant question, but not one which requires taking a stand on where the economy will or should return.

B.   The CAB as an index of sustainability

The CAB is often interpreted as an index of sustainability of fiscal policy, as providing the answer to the question: "Can the current course of fiscal policy be sustained, without exploding -- or imploding -- debt? Or will the government have to increase taxes, decrease spending, have recourse to monetisation, or even repudiation?"

Again, quite apart from the effects of fiscal policy on the economy, this is obviously an important question to answer. It is important to know for example whether a large deficit will naturally disappear in time, or will have to be eliminated through painful adjustments.

The logic underlying the use of the CAB in this context is simple: cyclical movements in the deficit even out over the cycle, so that it is appropriate to look at the cyclically adjusted deficit, sometimes called in this context the "structural" deficit (3). While the logic is simple, the CAB, as an index of sustainability, is deficient in two respects:

i) It is incomplete as there are many other factors, beyond movements in aggregate activity, which make the future potentially quite different from the present. This includes, as before, changes in inflation or real interest rates. But other factors are important as well. Revenues from the North Sea oil will disappear in the United Kingdom; the lack of maintenance of infrastructure in most OECD countries since the mid-'70s will require higher investment later. At a longer horizon, social insurance programmes and the changing composition of the population imply much larger transfers, starting in a few decades, and so on.

ii) Assessing sustainability necessarily involves predicting the future. Thus, as opposed to the question of discretionary versus induced changes in the fiscal position, an index of sustainability cannot avoid taking a stand on where the economy is likely to go in the future. The mid-cycle correction can be interpreted as assuming that the economy will return to its mid-cycle position relatively quickly; otherwise, the correction makes little sense.

This implicit assumption more than any other is what got cyclically adjusted measures in trouble in the early 1980s. That a large deficit looked like a surplus when estimated at the mid-cycle point was small comfort to those European countries that did not expect to reach such a point in the foreseeable future. The general revision of mid-cycle points downwards (as well as the shift from high employment to mid-cycle employment as the reference point) made cyclically adjusted deficits look more like actual deficits, and was a politically astute response to the problem. But it was not the appropriate conceptual response. What matters in terms of sustainability is where the country expects to be over the next three to ten years, not necessarily some mid-cycle point. The OECD makes two-year projections. Most OECD countries make longer horizon projections. While the limits of those projections are well understood, the assumption that the economy will follow the forecast path must be an improvement over the mid-cyle adjustment.

These considerations suggest how one can improve upon the CAB as an index of sustainability, by making heavier use of forecasts, and by incorporating some of the other predictable changes in the budget. Issues of sustainability basically involve only accounting identities and the use of forecasts. Given the forecasts, it is, as we shall see, easy to come up with simple and non-controversial indicators. The same is definitely not true of the next set of issues, the effects of fiscal policy on the economy.

C.   The CAB as an index of fiscal policy on the economy

The CAB is often used as an indicator of the effect of fiscal policy on economic activity (for example see Eisner and Peiper (1984)). Increases in the cyclically adjusted deficit are taken to be expansionary, decreases contractionary.

If the goal is to assess the effects of fiscal policy on the economy, is the CAB a good measure of fiscal impact? The debate on this point has been murky. The murkiness comes partly from some confusion, partly from the complexity of the question itself. It is best to first get three issues out of the way:

i)   Fiscal policy affects the macroeconomy through two main channels. The first is the set of distortions implied by the tax/incentive structure on individual decisions. The second is the effect of fiscal policy on aggregate demand, which would arise even if all taxes were lump sum. It is clear that the CAB is only aimed at this second channel. With the increased emphasis on the medium run however, a set of indicators describing the effects of fiscal policy on the economy should deal with both and I shall do so later. The rest of the discussion here focuses on the second channel only.

ii)   It is essential to distinguish between the impact effect of fiscal policy -- the effect of fiscal policy given income, interest rates, exchange rates, and the final effect -- the general equilibrium effect on output, interest rates and so on, once those variables are allowed to adjust. Whether an increase in government spending translates in an increase in interest rates with no change in output, or in an increase in exchange rates with no change in output, or in an increase in output with no change in interest rates, depends on whether the labour force is fully employed, whether monetary policy accommodates, whether the economy operates under fixed or flexible exchange rates and so on. The answer to the question is far beyond what can be asked of any indicator, or any set of indicators for that matter. Only simulations of full scale macroeconomic models can shed light on those effects. An indicator can only be about impact effects. The discussion of fiscal indicators is however often implicitly about final effects. The early OECD indicators, suggested by Hansen at a time when macroeconomists were more confident about their understanding of the macroeconomy, were indeed about final effects. They weighted the different elements of the budget by the appropriate multiplier; that this was too ambitious and too model dependent was eventually recognised by the OECD. A justification given for use of the CAB is sometimes based on a simple IS model, in which it is argued that what matters ultimately for output are taxes and spending evaluated at full employment; the tax rate is then part of the multiplier (4). This argument, which is correct within the logic of the IS model, is, however, about final effects, not impact effects of policy.

iii) The effects of fiscal policy on aggregate demand and on aggregate saving are sometimes discussed separately, as if these were different issues. If we limit the discussion of fiscal policy to its impact effects -- that is, given income in particular -- the two are nearly (apart from public investment) opposite sides of the same coin, and do not require separate analyses. Again, whether in the end an increase in public dissaving translates into higher output and higher aggregate saving, or into unchanged output, higher rates and smaller aggregate saving depends on the situation of the economy; this is a central issue, but one which lies outside the scope of a fiscal indicator.

With these three issues out of the way, we can rephrase the question as: "Ignoring distortion effects, what is the impact effect of fiscal policy on aggregate demand?" With the question defined this way, I can see little justification for using the CAB as a measure of fiscal impact.

i) Even within the logic of the simplest IS model, in which consumption depends on current income net of taxes, the CAB does not come out as a natural measure of fiscal impact. As is well known, with a marginal propensity to consume less than one, changes in taxes have less impact on demand than changes in spending, so that the CAB, the difference between the two at mid-cyle, is not a sufficient statistic. Another related argument used to justify the CAB is that, by removing the effects of activity on the budget, the CAB can be used as an explanatory variable and is not subject to simultaneity bias. The cyclical adjustment may or may not remove all the simultaneity bias (5). Even if it does, it clearly does not follow that the CAB is a proper indicator of fiscal impact.

ii) Consumption does not depend only on current income. Asset values as well as expectations matter, and looking at just current taxes and transfers is likely to be misleading. This argument is sometimes used to provide a different justification for the CAB: by looking at the balance at mid-cycle, it assumes that consumers react not to current taxes and spending, but rather to normal, mid-cycle, taxes and spending. There is, however, no reason to believe that the mid-cycle adjustment is the proper or the best adjustment. Indeed, the complexity of the interaction between expectations and fiscal programmes has led some to argue that deficit measures are useless for the purpose of assessing the impact of fiscal policy and should simply be abandoned [Buiter (1985), Auerbach and Kotlikoff (1987), Kotlikoff (1988a)]. And not only are the conceptual issues complex, there is, after a decade of intense theoretical and econometric work on consumption, substantial disagreement as to the degree of foresight of consumers. Thus, in thinking about indicators of fiscal impact, one faces two challenges. The first is the complexity of any measure derived from theory; the second is the wide set of measures suggested by alternative theories and alternative views of the degree of foresight of consumers. I shall jump into the fray and propose indices of fiscal impact later. But it is clear that any index of fiscal impact will depend both on assumptions

about the future, and assumptions about the degree of foresight of consumers. Indices of fiscal impact must, therefore, be regarded as more tentative than, say, indices of sustainability.

D.   The CAB as a normative index

Maintaining a CAB, presumably inflation-adjusted, equal to zero is sometimes taken to be a desirable goal. It is difficult to see what reasoning underlies that argument. The only rationale for maintaining a constant CAB is that it is a simple hands-off rule, and is probably better than keeping, say, the actual balance constant. Going beyond that argument, the CAB is, as we have just seen, unlikely to be a good index of the effects of fiscal policy on demand, so that keeping it constant is unlikely to be right for anything. Furthermore, there is no justification for thinking that the level of national savings generated by the private sector is optimal, so that public saving should be on average equal to zero. And there is also no reason to think that the automatic stabilisers provide the optimal amount of stabilisation. These are important issues for fiscal policy, but not issues that fiscal indicators can or should be about.

II. CONSTRUCTING INDICATORS: A GENERAL STRATEGY

This first pass suggests that there are four aspects of fiscal policy for which one would like to have indicators:

i)   Changes in policy: "Of the changes in the fiscal position (taxes, transfers, spending), what part is due to changes in the economic environment and what part is due to changes in policy?"

ii) Sustainability: "Can the current course of fiscal policy be sustained, without exploding -- or imploding -- debt? Or will the government have to increase taxes, decrease spending, have recourse to monetisation, or even repudiation?"

iii) Effects on aggregate demand/saving: "At given income, interest and exchange rates, ignoring distortions, what is the effect of fiscal policy on aggregate demand?"

iv) Effects through distortions: "What are the distortions on investment, saving, labour supply and labour demand coming from the tax/incentive structure?"

The four questions are listed in increasing order of difficulty.

The first presents no conceptual difficulty and does not involve forecasts. All which is required is a set of elasticities of the different components of the budget with respect to the main macroeconomic variables, and the choice of a benchmark.

The second presents also few conceptual difficulties. The conceptual framework consists mostly of accounting identities. It requires, however, forecasting movements in the components of the budget, in principle far in the future. The practical issue is one of deciding how far in the future the indicator should look.

The third and fourth involve both conceptual issues and -- more so for the third than the fourth -- the use of forecasts. They rely on theories of how fiscal policy affects aggregate demand, of how taxes affect decisions about labour supply, investment. Thus, the choice of an indicator involves both a choice among theories, and a choice of how far in the future to look.

In thinking about indicators of fiscal policy to be used by an international organisation, the following rules seem reasonable:

An indicator, if it is going to be used at all, must be simple, or at least look simple. This is surely one of the main strengths of the CAB; indeed, _ceteris paribus_, I see it as a plus that the indicator resembles more or less closely some notion of a deficit. (As will be clear below, I believe that deficits are a useful notion, and should not be discarded).

Ceteris paribus, an indicator which requires as few explicit forecasts as possible in its construction is more likely to be used. For the last three questions, theory suggests, however, a strong role for the expected future, and there is, therefore, a trade-off between theoretical purity -- and potential accuracy -- and leaving out forecasts. I "solve" this dilemma -- dodge the issue? -- by suggesting in each case at least two indicators, one which involves only current data, and one which requires forecasts for its construction.

Finally, while I have argued above that a single index such as the CAB cannot accomplish all the tasks, it must be true, again _ceteris paribus_, that a small set of indicators must be better than a long list. The list that I suggest below is probably too long and should be thought more of as a menu. I return to this issue in the conclusion.

III. INDICATORS OF DISCRETIONARY FISCAL POLICY

How much of the increase in deficits in Europe in the 1970s was the result of a slowdown in economic activity leading to a large increase in spending with lagging receipts, and how much was the result of discretionary changes in spending due to new programmes? Were European countries back to their unemployment rate of 1970, what would government spending and receipts look like? These are the questions that an indicator of discretionary changes in fiscal policy should help answer.

As I have argued earlier, the construction of such an indicator presents no conceptual and few empirical difficulties. It requires a benchmark and a set of elasticities.

a) The benchmark could be an arbitrary set of numbers for inflation, real interest rates and unemployment, say 0, 2 and 5 per cent. The danger is that any such benchmark is likely to be given normative significance, as the set of numbers preferred or advocated by the OECD. Thus, a mechanical benchmark appears better.

The simple benchmark given by last year's unemployment rate, real interest rate, and inflation rate is simple and has the added advantage over, say, the average of the last ten years, of satisfying the chain rule: if the

OECD publishes every year both discretionary and induced changes in the budget, a user can then simply find the induced change in the budget over any period of time by adding up induced changes for each year over that period of time.

Clearly, all that is in fact needed is the publication of the elasticities used for the adjustment. Quite apart from the publication of an indicator, those elasticities should be published, allowing users to compute the change with respect to any benchmark they like.

b) The benchmark should include unemployment, real interest rates and inflation, the main three macroeconomic variables which affect the budget. Other adjustments, say for demographic changes in the population and their effect on the demand for medical care or retirement benefits, have also been suggested. While they lead to substantial changes in the budget over long periods of time, they move slowly enough that they can be ignored in an annual indicator.

Adjustments for movements in unemployment should follow the current methodology, using an Okun's Law coefficient for the relation between output and unemployment, and a set of elasticities of the different components of the budget with respect to output (6).

A simple way of adjusting for changes in inflation and real interest rates is to focus on the deficit net of interest payments, i.e. on the primary deficit. This is a quick and simple fix, which is not quite right but may be close enough. It is not quite right as changes in debt are the result of past fiscal policy, not of changes in the environment and therefore should but would not appear in such a corrected measure; changes in debt are small however on a yearly basis. Changes in inflation can have substantial effects on receipts if the tax system is incompletely indexed; these would not be adjusted for in the corrected measure.

These considerations suggest the following indicator of discretionary changes in policy, the "indicator of discretionary change": <u>the value of the primary surplus which would have prevailed, were unemployment at the same value as in the previous year, minus the value of the primary surplus in the previous year, both in ratio to GNP in each year</u>.

This indicator results from the application of corrections to the budget deficit and its basic components. But a similar adjustment can be applied straightforwardly to all of the indicators developed below. One can ask how much of the change in the indicator of sustainability developed below is due to changes in the economy (current or expected), and how much is due to changes in policy, and use the same approach as the one used here on the components of that indicator.

IV. INDICATORS OF SUSTAINABILITY

Here are some of the questions that an index of sustainability should help answer. Can Italy go on with its current policy, or will it have to increase tax rates, decrease spending or consider more drastic means of decreasing the debt burden? If an adjustment is needed, what is the fiscal cost of delaying it, say for a few years? Can the United Kingdom safely

decrease its current fiscal surplus by reducing taxes, or will it be forced to increase them again in the future? As argued earlier, the answer to those questions involves accounting identities and forecasts. First the accounting identities:

A.   The arithmetic of budget constraints

The starting point of any discussion of sustainability is the dynamic government budget constraint, which is given by:

[1] $dB/ds = G + H - T + rB = D + rB$,

where B is real debt, G is government spending on goods and services, H is transfers, T is taxes, D is the primary deficit G+H-T, and r is the real interest rate. s denotes time. Rewriting the budget constraint in terms of ratios to GNP (denoted by lower case letters):

[2] $db/ds = g + h - t + (r-\theta)b = d + (r-\theta)b$

where θ is the rate of growth of GNP. I shall assume that the real interest rate exceeds the growth rate, that $r-\theta$ is positive. This is an important assumption, one which was not satisfied ex post in the 1970s, but has been amply satisfied since (7).

Fiscal policy is a sequence of (g,h,t) and an initial value of b, b_0. It is sustainable if real debt does not explode faster than the interest rate, or equivalently if the ratio of real debt to GNP does not explode faster than the excess of the interest rate over the growth rate. If it is sustainable, then the following intertemporal budget constraint holds:

[3] $\int d \exp - (r-\theta)s \, ds = -b_0$

where the integral runs from zero to infinity, and r and θ are assumed constant for notational simplicity. For fiscal policy to be sustainable, the present value of primary surpluses (-d), discounted at, $r-\theta$, must be equal to the initial level of debt.

With those preliminaries out of the way, we can start thinking about sustainability. Ex post, equation [3] will clearly be satisfied, perhaps through adjustment of taxes or spending, perhaps by monetisation or repudiation. The question is: given the current setting of fiscal policy, will there be a need for a drastic readjustment and, if so, of what magnitude?

One way of going at that is to ask: suppose that we take the sequences of g and h, spending and transfers in terms of GNP as given (b_0 is obviously given also). What is the constant tax rate, t, which insures sustainability? Call it the "sustainable" tax rate. Then the difference between the actual and the sustainable tax rate gives a measure of changes to come. The same approach could be used to compute the "sustainable" spending rate given the sequences of t and h, or the "sustainable" transfer rate given the sequences of g and t. But, taxes are more likely to be the factor which is adjusted; thus focusing on t is probably the thing to do. Solving equation [3] for the sustainable tax rate t* gives:

[4] $t^* = (r-\theta) [(\int(g + h)\exp - (r-\theta)s \ ds) + b_0]$

or equivalently

[4'] $t^* = (r-\theta) [(\int(g + h + (r-\theta)b_0)(\exp - (r-\theta)s)ds]$

The sustainable tax rate is equal to the annuity value of spending plus transfers plus interest net of growth times the initial level of debt (8).

From a theoretical point of view (t^*-t) is a good index of sustainability (9). What a positive (t^*-t) implies will vary across countries, depending in particular on the initial level of t. In a country in which t is low, a positive t^*-t will indicate a need for a mid-course correction at some stage in the future. But if t is already high, a positive t^*-t will indicate a risk of crisis, of pressure to resort to monetisation of the debt and to consider various forms of repudiation. (To the extent that the dangers associated with a positive (t^*-t) increase with the initial level of t, this strongly argues against the use of some normalised index such as $(t^*-t)/t$).

Given (t^*-t), one can answer another important question about sustainability. Suppose that adjustment is delayed for some time, say five years. When the adjustment takes place, the debt ratio will be higher, requiring a larger value of t^*. By how much will t^* have to increase in order to achieve sustainability then? What is the cost of delay? Manipulation of the equations above give the simple answer:

[5] $dt^*/ds = (r-\theta)(t^*-t)$

Thus, if for example, $(r-\theta)$ is equal to 2 per cent, and t^*-t is equal to 5 per cent, waiting 10 years to adjust will increase t^* by 1 per cent.

B.   <u>Three indices of sustainability</u>

The difference between the sustainable and the actual tax rates, (t^*-t), may be the best theoretical indicator of sustainability; it cannot however be constructed. The value of the discount rate $(r-\theta)$ is small: this implies that one must make projections of g, h far in the future, far beyond what is known with any accuracy. I suggest constructing the following three indices which differ in the amount of forecasts they require:

The simplest indicator, which does not require forecasts, is suggested by equation [2]. Call it the "primary gap". It is equal to $-(d + (r-\theta)b)$, <u>the primary surplus minus the debt to GNP ratio multiplied by the difference between the real interest rate and the growth rate</u>.

If the actual values of r and θ are used, this indicator is just equal to the change in the debt to GNP ratio. It is probably better to use constant values of r and θ, say the averages over the last 10 years or so. It is clear however that the indicator is very primitive: it takes no account of the predictable changes coming from predictable changes in the economy or in policy. The next indicators are more ambitious but rely on explicit forecasts.

To motivate them, define t_n^* as the tax rate such that b in n years is the same as b_0. Then t_n^* is given by:

[6] $t_n{}^* = (r-\theta)\{(1 - \exp - (r-\theta)n) {}^{-1}[\int(g+h)\exp - (r-\theta)s\ ds] + b_0\}$

As n goes to infinity, $t_n{}^*$ goes to t^* (10). If $(r-\theta)$ and n are not too large, the tax rate $t_n{}^*$ is roughly equal to the average value of g and h over the next n years, plus the interest rate net of growth times initial debt:

[7]. $t_n{}^* \simeq$ (average over the next n years of g+h) + $(r-\theta)b_0$

This suggests constructing two indicators, one for a low value of n and one, more tentative, for a higher value of n.

The second indicator I therefore suggest is $(t_3{}^*-t)$, call it the "medium-term tax gap", the average over the current and the next two years of spending and transfers as ratios to GDP, plus the ratio of debt to GDP times the interest rate minus the growth rate, minus the current tax rate. The choice of three years is rather arbitrary: the idea is to construct the indicator using available projections of g and h, and the longest span of time for which such projections are available should determine the choice.

An alternative indicator, very close in spirit to this one, but which uses information about future tax rates is the average of the primary gap over the current and the next two years, based on forecasts of spending and taxes over the next two years. Both indicators can take into account predicted cyclical movements which are not revealed by the first indicator.

Neither of these indicators takes into account the more distant future. Recent work by the OECD shows how large the impact of the changing composition of the population on the budget is likely to be over the next 30-50 years (11). It shows that, for Germany for example, unchanged benefit and retirement age policies would lead to an increase in the contribution rate as a percentage of taxable payroll of close to 20 per cent. This is an important piece of information, one highly relevant to the discussion of sustainability for Germany. This suggests that a third indicator, such as $(t_{50}{}^*-t)$, call it the "long term tax gap", is probably worth constructing, despite the obvious difficulties in doing so. What it should include needs experimentation through time. At a minimum, it should focus on the major transfer programmes, which are likely to account for the bulk of the expected changes in taxes over such horizons, and make simple assumptions about other programs. But it could clearly include more, such as the need to replace public capital, the disappearance of major sources of revenues and so on.

V. INDICATORS OF FISCAL IMPACT ON AGGREGATE DEMAND

In 1987, the United Kingdom ran a deficit of 1.5 per cent of GDP, a primary surplus of 1.3 per cent. The cyclically adjusted deficit was 0.1 per cent, the cyclically and inflation adjusted surplus was 1.4 per cent, the cyclically adjusted primary surplus was 2.6 per cent. Was the impact effect of fiscal policy on aggregate demand, ignoring changes in distortionary taxation and benefits, positive or negative? Or can't we tell? These are the questions that the indicator of fiscal impact should help answer.

The construction of an indicator of fiscal impact requires the use of theory. The relevant theory here is the theory of consumption: Fiscal policy affects aggregate demand through two channels: First, it determines public spending, including public investment. These are direct effects, affecting aggregate demand roughly one for one (12). Second, taxes and debt affect aggregate demand through consumption. The issue is that of the reaction of consumers to debt and taxes. This section thus starts with a review of what we know about consumption in that respect.

A.   Consumption, debt and taxes

a) Much of the recent theoretical work has centred, following Barro (1974), on the Ricardian equivalence proposition (13). Under that proposition, consumers act as if they were infinitely long lived and the financing of a given stream of spending has no effect on consumption.

While I shall argue below that too much time has been spent taking that hypothesis seriously, it is useful, for later use, to review its logic and derive what the indicator would look like if the hypothesis were true. Under Ricardian equivalence, the consumption function satisfies (14):

[8] $C = a[B_0 + K + \int (Y-T) \exp(-rs) ds]$

Consumption depends on total wealth, defined as the sum of government debt, other forms of wealth K, and the present discounted value of labour income net of taxes, discounted at the interest rate. All taxes are assumed to be on labour income. From our earlier derivation, the intertemporal budget constraint of the government can be written as (15):

[9] $\int T \exp(-rs) ds = \int G \exp(-rs) ds + B_0$

Replacing [9] in [8] gives:

[10] $C = a[K + \int (Y-G) \exp(-rs) ds]$

Consumption depends neither on taxes nor on debt, but on the present value of spending. Collecting terms in aggregate demand which depend on fiscal policy gives us the effect of the sequence of spending on aggregate demand:

[11] $G - a \int G \exp(-rs) ds$

This is the indicator of fiscal impact which would be appropriate under Ricardian equivalence. It depends on the shape of the sequence of spending. Unusually high levels of spending today increase aggregate demand.

The Ricardian equivalence proposition however strains credulity. The issue is not that there are no bequests. Bequests account for an important part of wealth (16). But there are many motives behind bequests, motives which do not imply Ricardian equivalence (17). And the hypothesis requires too much foresight altogether. The few cases in which researchers have examined either the reaction of retirees to changes in social security payments (Wilcox 1989), or the joint behaviour of members of the same family (Hayashi and Kotlikoff, 1988) have yielded no evidence in favour of the proposition. The proposition has no claim to be an empirical benchmark.

b) The obvious alternative is the life cycle theory, in which consumers plan consumption over their lifetime. This alternative implies potentially strong effects on aggregate demand of transfers across generations, and of intertemporal reallocations of taxes.

There is considerable evidence that workers plan for their retirement, either directly, or through employer provided pension plans. This strongly suggests that, despite the lack of hard econometric evidence, social security and other transfer programmes are very likely to affect savings (18).

Should we then assume the pure life cycle model as the maintained model of consumption? This is what Kotlikoff and Auerbach (1987) have done to examine the effects of fiscal policy, one of their conclusions being that no simple index is likely to capture the complex effects of fiscal policy on aggregate demand.

The evidence suggests however that the degree of foresight implied by the pure life cycle model, with consumers planning over their expected life and taking careful account of all contingencies far exceeds that found in reality. That consumption smooths income, and that temporary changes in income lead to smaller movements in consumption, is not in doubt. And from the careful econometric work which has been done over the last ten years, there is substantial evidence that consumption depends on expectations of future income (19). The question is however one of degree. An important piece of evidence, directly relevant for fiscal policy, is that none of the announced tax changes in the United States over the post-war period, including the tax reductions enacted in 1981 to take place over the following two years, had any apparent effect on consumption before they were actually implemented (20) ...

c) If consumers exhibit limited foresight, it is quite possible that they also exhibit money or cash illusion. There are two main channels through which fiscal policy may interact that money or cash illusion to affect aggregate demand. The first are changes in taxes which affect the distribution of cash profits between firms and their owners. The question of whether consumers pierce through the corporate veil is an old one. Careful examination of the evidence suggests only partial piercing (21). The second is the question of the treatment of the inflation component of nominal interest payments on government debt. There is no issue that, in analysing government accounts, or in dealing with issues of sustainability, the inflation correction should be made. From the point of view of the effect of fiscal policy on aggregate demand however, the question is whether consumers themselves make the proper adjustment. The evidence suggests only limited inflation illusion, in particular at high levels of inflation (22). But, inflation illusion need not be substantial for the effects to be potentially large. With a debt to GDP ratio of 100 per cent, a misperception of only 2 per cent of inflation would lead consumers to misperceive income by 2 per cent, leading to large effects on aggregate demand. Another way of stating it is that in many countries in the 1970s, the size of the inflation adjustment was much larger than the size of the inflation adjusted deficit.

B.   A tentative assessment

This review of the empirical evidence suggests a characterisation of consumer behaviour half way between Modigliani and Friedman. Consumers think

about retirement, so that we would expect at least major changes in retirement programmes to have an effect on their consumption and saving behaviour. In that respect, consumers are life cyclers. But, otherwise, consumers do not seem very far-sighted, looking at most a few years into the future, as suggested by Friedman.

This suggests a schizophrenic approach to the construction of indicators. One indicator -- or set of indicators -- should focus on the effects of changes in taxes, transfers, and spending programmes, assuming limited foresight on the part of consumers. But the fact that consumers also think about retirement and that the next 50 years will see major changes in population structure and implied intergenerational transfers suggests the need for another indicator -- or set of indicators -- focusing on the potential implications of retirement programmes on saving. That indicator should be derived from life cycle theory. While this may give too much foresight to consumers, there is no obvious alternative.

This will be the strategy adopted below. Before this is done, I focus more formally on the implications of a theory of consumption where consumers have limited foresight. A consumption function which captures this idea is:

$$[12] \quad C = a[B+K] + b[\sigma\int(Y-T)\exp(-\sigma s)ds]$$

Consumption depends on financial wealth, which is the sum of government debt and other forms of wealth, and on the present discounted value of labour income net of taxes. The parameter σ captures the degree of foresight of consumers.

This consumption function is a close cousin to many familiar ones. With $a=b$ and $\sigma=r$, it is the same as the consumption function (8), which satisfies Ricardian equivalence. But, as I have just argued, σ is likely to be much larger than r. It is very similar to the consumption function estimated by Hayashi (1982) on U.S. data, who imposes that $a=b\sigma$, and finds estimates of a of 0.07 and of σ of 15 per cent per year. It is very similar to the consumption function derived and estimated by Modigliani (1971) for the MPS model, which replaces the second term by a distributed lag of disposable income, and who finds values of a of 0.05 and of b of 0.67. These are useful values to keep in mind below.

Taking [12] as the consumption function, what is the impact effect of fiscal policy on aggregate demand? Collecting the terms in [12] which depend on fiscal policy, as well as the direct effect of government spending on aggregate demand gives :

$$[13] \quad [aB - b\sigma(\int T \exp(-\sigma s)ds)] + G$$

This expression shows how current spending, debt and current and anticipated taxes affect aggregate demand. It also shows how many assumptions have to go into the construction of an indicator of fiscal impact. While constructing an indicator along the lines of [13], using estimates of a, b and σ, and forecasts of G and T would be a useful research endeavour, such an indicator would not satisfy the conditions set down in Section 2 (23). Thus, in what follows, I look for simpler constructs, which nevertheless capture the main effects characterised in [13].

C.   Three indicators of fiscal impact

    To derive the first indicator, I take as a constraint that it can only depend on current values of spending, taxes and transfers, and cannot depend for its construction on forecasts. To return to the question posed at the beginning of the section, should the indicator look more like the actual deficit, the inflation adjusted deficit, the primary deficit, or yet some other measure?

    Equation [13] suggests the answer. Suppose that expectations of future taxes are equal to current taxes. The index of fiscal impact corresponding to equation [13] becomes:

    aB - bT + G

    This clearly does not correspond to any particular deficit, as it still depends on the marginal propensities to consume out of wealth and out of labour income. If we assume that the marginal propensities to consume out of labour and interest income are the same, then the index becomes $b(rB-T)+G$. The discussion is then a familiar one, from the discussion of the effects of taxes and spending in the simple IS model. While the measure is still not equal to any deficit measure, it shows that what matters is simply current taxes, current spending and interest payments. Thus, among deficit measures, the best measure is the actual deficit. Whether it should be inflation adjusted depends on the degree of inflation illusion. The evidence reviewed above suggests that, if the choice is between adjusting or not adjusting for inflation, adjusting probably dominates. Thus, the first indicator of fiscal impact I suggest is simply the inflation adjusted deficit as a ratio to GDP (24). Note that this indicator does not distinguish between active and induced changes in the deficit; I see no reason to do so here.

    The second indicator takes into account expectations. Equation (13) suggests that the circumstances under which the first indicator is likely to be misleading are those where future taxes differ substantially from current taxes. This may for example be the case when government spending is so much larger than current receipts that increases in taxes are widely anticipated, or when the government is collecting a one time levy. A simple measure which captures those effects, which I suggest as a second indicator of fiscal impact, call it the "adjusted deficit" is:

    (g + rb - (average over the current and next two years of t))

    That the measure does not do full justice to equation [13] is clear. But it captures the basic idea of that equation, that future taxes may matter (note the asymmetry between spending and taxes: future spending does not matter directly). The choice of three years is again somewhat arbitrary: we do not know whether consumers look one or, say, five years ahead. The main consideration is again largely the availability of data. Both the medium-term tax gap and this index require roughly the same projections.

    The third indicator attempts to peer into the distant future. I have argued that, even if consumers do not in general look forward very far, they still think about retirement. Consider the change in the social security

system which took place in 1983 in the United States, and which implied, among other changes, a large decline in the present discounted value of benefits accruing to current contributors. It is plausible that this change led many contributors to increase their own private saving, and pension funds to reassess their level of contributions and benefits, if not in 1983, at least over the time. It is worth constructing a indicator which can reflect such changes. While I have not thought enough about it to suggest a specific indicator, a first step, which would extend work already done by the OECD, would be to construct present discounted values of net benefits (benefits minus contributions) accruing to different age groups in the population over their expected lifetime under the current legislation. Increases in such a present value are likely to increase consumption.

The difficulties involved in constructing the indicator are clear. The interpretation of movements in such an indicator is also difficult. For example, the same changes in fertility rates which triggered the change in social security in 1983 have also major implications for aggregate saving in the future. The increasing portion of dissavers to savers is likely to decrease the aggregate savings rate, and any movement in the indicator should be interpreted in the light of this evolution of the savings rate. The 1983 change also involved a gradual increase in the retirement age, which also has quantitatively important implications for private savings, implications which would not be reflected in the indicator. Despite the difficulties of construction and interpretation, such an indicator still appears potentially useful.

VI. INDICATORS OF FISCAL DISTORTIONS

The previous section has focused on the effects of fiscal policy on saving and aggregate demand, ignoring the distortions on relative prices introduced by fiscal policy. But the effects implied by those distortions may be just as important as the effects we have focused on. This may be true even in the short run, even if we assume that the short term is dominated by movements in aggregate demand. An investment tax credit can have strong effects on investment, and thus on aggregate demand. By changing the prices of assets, fiscal policy may also affect directly consumption and investment.

Analysing the effect of tax structures on economic decisions is, to put it mildly, beyond the scope of this report. Many indicators exist here. The OECD has constructed marginal tax rates on labour and capital use (25). All which may be necessary is to give two such tax rates equal status with those indicators developed in the previous section in assessing fiscal policy.

CONCLUSION AND SUMMARY

I have argued that there are four main questions that fiscal indicators can help answer:

   i) Changes in fiscal policy: "Of the changes in the fiscal position (taxes, transfers, spending), what part is due to changes in the economic environment and what part is due to changes in policy?"

ii) Sustainability: "Can the current course of fiscal policy be sustained, without exploding -- or imploding debt --? Or will the government have to increase taxes, decrease spending, have recourse to monetisation, or even repudiation?"

iii) Effects on aggregate demand/saving: "At given income, interest and exchange rates, ignoring distortions induced by the tax/benefit system, what is the effect of fiscal policy on aggregate demand,?"

iv) Effects on aggregate supply: "What are the distortions on investment, saving, labour supply and labour demand coming from the tax/incentive structure?"

In answer to the first, I have suggested the use of an "index of discretionary change", defined as the value of the primary surplus which would have prevailed, were unemployment at the same value as in the previous year, minus the value of the primary surplus in the previous year, both in ratio to GNP.

In answer to the second and third questions, I suggest in each case the use of three indices. In each case, one index is completely myopic, one index looks into the near future, and the third peers into the far future. In each case, I see the second index as being the index the OECD should concentrate on in its discussion of fiscal policy. The first should be computed and reported because of its non reliance on forecasts. The third should be computed to detect more distant contingencies, but its construction is more in the nature of an academic endeavour.

The three indicators of **sustainability** are as follows:

The first is the "primary gap", defined as the primary surplus as a ratio of GNP minus the debt-to-GNP ratio multiplied by the difference between the real interest rate and the growth rate. The other two are forward looking measures. The second is the "medium term tax gap", defined as the average of the sum of government spending plus transfers, as ratio to GNP, over the current and following two years, plus the debt-to-GNP ratio multiplied by the difference between the real interest rate and the growth rate, minus the current tax rate. The third is the "long-run tax gap", defined as the average of the sum of government spending plus transfers, as ratio to GNP, over the next 50 years, plus the debt-to-GNP ratio multiplied by the difference between the real interest rate and the growth rate, minus the current tax rate.

The three indicators of **fiscal impact** on demand are as follows:

The first is simply the inflation adjusted deficit, with no further adjustments. The second is the level of government spending including real interest payments on the debt, minus the average of the tax rate over the current and the next two years. The third which I have not fully characterised should capture the effects of retirement programmes on current consumption.

Finally, I have not dealt with indicators of fiscal impact through distortions other than to suggest the use of existing measures of marginal tax rates on labour and capital on a par with the previous indicators of fiscal impact.

Are these too many indices? I believe that, in a preliminary phase, constructing and computing all these indices in house would be useful. But it is clear that the OECD should, in its official assessments of fiscal policy, emphasise only a few. A list composed of i) the primary deficit, ii) the index of discretionary change, iii) the medium tax gap, is my candidate short list.

NOTES

1. Campbell and Mankiw (1987). Blanchard and Quah (1989) review recent research.

2. Brown (1956).

3. For a clear statement of this view, see Muller and Price (1984).

4. See Haliassos and Tobin (1989) for a review.

5. See Grignon and Sartor (1988) for a discussion.

6. Sartor (1989).

7. When the growth rate asymptotically exceeds the interest rate, the government does not have a sustainability constraint: it can issue debt without ever needing to reimburse it. For further discussion, see for example Blanchard and Fischer (1989), Chapter 2.

8. Barro (1987) derives the sustainable tax rate as an optimal tax rate in an economy which satisfies Ricardian Equivalence.

9. This approach is closely related to approaches which focus on the net worth of the government. See Buiter (1985) for further discussion and references.

10. This might be surprising at first; but imposing asymptotically the condition that b does not explode at rate $(r-\theta)$, or that b goes to some constant leads to the same value of t^*.

11. Hagemann and Nicoletti (1989).

12. The qualification comes from the possibility that part of public spending is a direct substitute for either private consumption or private investment. These direct effects are likely to be small.

13. See Bernheim (1987) for a review.

14. This assumes logarithmic utility, and constant interest rates. This is done for notational simplicity; the argument is more general.

15. This differs from equation [3] by being in levels rather than in ratios of GDP. But the derivation parallels that of equation [3].

16. See Kotlikoff and Summers (1981), Kotlikoff (1988b), Modigliani (1988) for a lively discussion.

17. See again Bernheim.

18. Feldstein (1974).

19. For a recent analysis, see Campbell and Mankiw (1989).

20. Poterba (1988).

21. See Poterba (1987) for evidence and further references.

22. Nicoletti (1988).

23. I have indeed constructed a closely related indicator to study the impact effects of fiscal policy in the United States over the 1970s and early 1980s. (See Blanchard (1985) for a theoretical derivation of the index, Blanchard and Summers (1984) for the construction of the empirical counterpart.)

24. From Section I, movements in the inflation adjusted deficit can obviously be decomposed into discretionary and induced movements. But, the motivation for doing so is that given in Section I, not that discretionary movements are a better measure of impact.

25. See McKee, Visser and Saunders (1986).

REFERENCES

Auerbach, Alan and Laurence Kotlikoff (1987), <u>Dynamic Fiscal Policy</u>, Cambridge University Press, Cambridge.

Barro, Robert (1974), "Are Government Bonds Net Wealth?", <u>Journal of Political Economy</u>, 81, pp. 1105-1117.

Barro, Robert (1987), "Government Spending, Interest Rates, Prices and Budget Deficits in the United Kingdom, 1701-1918", <u>Journal of Monetary Economics</u>, 20-2, pp. 221-248.

Bernheim, Douglas (1987), "Ricardian Equivalence: An Examination of Theory and Evidence", <u>NBER Macroeconomics Annual</u>, pp. 263-303.

Blanchard, Olivier (1985), "Debt, Deficits and Finite Horizons", <u>Journal of Political Economy</u>, 93, pp. 223-247.

Blanchard, Olivier and Lawrence Summers (1984), "Perspectives on High World Real Interest Rates", <u>Brookings Papers on Economic Activity</u>, 2, pp. 273-334.

Blanchard, Olivier and Danny Quah (1989), "The Dynamic Effects of Aggregate Demand and Aggregate Supply Shocks", <u>American Economic Journal</u>, September, forthcoming.

Blanchard, Olivier and Stanley Fischer (1989), "Lectures on Macroeconomics", MIT Press.

Bredenkamp, Hugh (1988), "The Cyclically Adjusted Deficit as an Index of Fiscal Stance", <u>U.K. Treasury Working Paper</u> 102, April.

Brown, E. Cary (1956), "Fiscal Policy in the 'Thirties': A Reconsideration", <u>American Economic Review</u>, 46, December.

Buiter, Willem (1985), "A Guide to Public Sector Debt and Deficits", <u>Economic Policy</u> 1, pp. 13-60.

Campbell, John and N. Gregory Mankiw (1987), "Are Output Fluctuations Transitory?", <u>Quarterly Journal of Economics</u>, 102-4, November, pp. 857-880.

Campbell, John and N. Gregory Mankiw (1989), "Consumption, Income and Interest Rates: A Reconsideration of the Evidence", <u>NBER Macroeconomics Annual</u>, forthcoming.

Eisner, Robert and Paul Peiper (1984), "A New View of the Federal Debt and Budget Deficits", <u>American Economic Journal</u>, 74-1, March, pp. 11-29.

Feldstein, Martin (1974), "Social Security, Induced Retirement, and Aggregate Capital Accumulation", <u>Journal of Political Economy</u>, 82, pp. 905-926.

Grignon, Louis and Nicola Sartor (1989), "Fiscal Policy Indicators: Interpretation and Proposed Improvements", mimeo OECD.

Hagemann, Robert and Giuseppe Nicoletti (1989), "Ageing populations: Economic Effects and Implications for Public Finance", OECD <u>Department of Economics and Statistics Working Paper</u> No. 61, January.

Haliassos, Michael and James Tobin (1989), "The Macroeconomics of Government Finance", in Handbook of Monetary Economics, Benjamin Friedman and Frank Hahn eds, North Holland, forthcoming.

Hayashi, Fumio (1982), "The Permanent Income Hypothesis: Estimation and Testing by Instrumental Variables", Journal of Political Economy, 90-5, October, pp. 895-916.

Heller, Peter, Richard Haas and Ahsan Mansur (1986), "A Review of the Fiscal Impulse Response", IMF occasional paper, 44, May.

Kotlikoff, Laurence (1988a), "From Deficit Delusion to the Fiscal Balance Rule: Looking for an Economically Meaningful Way to Assess Fiscal Policy", mimeo December 1988.

Kotlikoff, Laurence (1988b), "Intergenerational Transfers and Savings", Journal of Political Economy, 2-2, Spring, pp. 41-58.

Kotlikoff, Laurence and Lawrence Summers (1981), "The Role of Intergenerational Transfers in Aggregate Capital Accumulation", Journal of Political Economy, 89-4, August, pp. 706-732.

McKee, Michael J., Jacob J.C. Visser and Peter G. Saunders (1986), "Marginal Tax Rates on the use of Labour and Capital in OECD Countries", OECD Economic Studies No. 7 (Autumn).

Modigliani, Franco (1971), "Monetary Policy and Consumption", in "Consumer Spending and Monetary Policy: the Linkages", Conference Series 5, Federal Reserve of Boston, June, 8-84.

Modigliani, Franco (1988), "The Role of Intergenerational Transfers and Life Cycle Saving in the Accumulation of Wealth", Journal of Political Economy, 2-2, Spring, pp. 15-40.

Muller, Patrice and Robert Price (1984), "Structural Budget Deficits and Fiscal Stance", OECD Department of Economics and Statistics Working Paper No. 15, July.

Nicoletti, Giuseppe (1988), "Private Consumption, Inflation and the 'Debt Neutrality' Hypothesis", OECD Department of Economics and Statistics Working Paper No. 51, January.

Poterba, James (1987), "Tax Policy and Corporate Savings", BPEA-2, pp. 455-503.

Poterba, James (1988), "Are Consumers Forward Looking?", AEA Papers and Proceedings, May.

Poterba, James and Lawrence Summers (1987), "Finite Lifetimes and the Effects of Budget Deficits on National Saving", Journal of Monetary Economics, 20-2, September, pp. 369-392.

Sartor, Nicola (1989), "New Measures of Cyclically Adjusted Balances", mimeo OECD, June.

Tullio, Giuseppe (1987), "Inflation Adjusted Budget Deficits and their Impact on the Business Cycle: Empirical Evidence for 8 Industrial Countries", EEC Internal Paper 62, November.

Wilcox, David (1989), "Social Security Benefits, Consumption Expenditure, and the Life Cycle Hypothesis", Journal of Political Economy, forthcoming.

ECONOMIC AND STATISTICS DEPARTMENT

WORKING PAPERS

In April 1983, the Economics and Statistics Department initiated a new series of economic studies entitled ESD Working Papers.

The following titles have been circulated:

1. Use of Demand Elasticities in Estimating Energy Demand (out of print)
   Utilisation des élasticités de la demande dans l'estimation de la demande de l'énergie

   Axel Mittelstädt

2. Capital, Energy and Labour Substitution: The Supply Block in OECD Medium-Term Models
   Substitution du capital, de l'énergie et du travail : le bloc de l'offre dans les modèles à moyen terme de l'OCDE (épuisé)

   Patrick Artus

3. Wage Formation in France: Sectoral Aspects (out of print)
   Formation des salaires en France : aspects sectoriels (épuisé)

   Patrick Artus

4. Service Lives of Fixed Assets (out of print)
   Durée de vie utile des actifs fixes (épuisé)

   Derek Blades

5. Resource Prices and Macroeconomic Policies: Lessons from Two Oil Price Shocks
   Prix des ressources naturelles et politique macro-économique : les enseignements de deux chocs pétroliers (épuisé)

   John Llewellyn

6. Output Responsiveness and Inflation: An Aggregate Study
   Souplesse de la production et inflation : étude globale

   David T. Coe and Gerald Holtham

7. The Determinants of Exchange Rate Movements (out of print)
   Les déterminants des mouvements des taux de change (épuisé)

   Graham Hacche

8. Simulated Macroeconomic Effects of a Large Fall in Oil Prices (out of print)
   Simulation des effets macro-économiques d'une forte baisse des prix pétroliers

   Flemming Larsen and John Llewellyn

9. Medium-Term Financial Strategy: The Co-ordination of Fiscal Monetary Policy (out of print)
   Stratégie financière à moyen terme : la coordination des politiques monétaire et budgétaire (épuisé)

   Jean-Claude Chouraqui and Robert Price

10. Price Dynamics and Industrial Structure: A Theoretical and Econometric Analysis (out of print)
    Dynamique des prix et structure industrielle : une analyse théorique économétrique (épuisé)

    David Encaoua (with collaboration from Paul Geroski and Riel Miller)

11. Evidence on Income Distribution by Governments (out of print)
    L'Action exercée par l'Etat sur la redistribution du revenu

    Peter Saunders

12. Labour Force Participation: An Analysis with Projections
    Taux d'activité : analyse et projections

    James H. Chan-Lee

13. The Demand for Money and Velocity in Major OECD Countries (out of print)
    La demande de monnaie et la vitesse de circulation dans les grands pays de l'OCDE

    A. Blundell-Wignall, M. Rondoni and H. Ziegelschmidt

14. The Conduct of Monetary Policy in the Current Recovery
    La conduite de la politique monétaire dans la phase actuelle de reprise économique

    Paul Atkinson and Jean-Claude Chouraqui

32. The Formulation of Monetary Policy: A Reassessment in the Light of Recent Experience

   Paul Atkinson and Jean-Claude Chouraqui

33. Mécanismes de transmission et effets macro-économiques de la politique monétaire en France : les principaux enseignements économétriques

   Marc-Olivier Strauss-Kahn

34. Pure Profit Rates and Tobin's q in Nine OECD Countries

   James H. Chan-Lee

35. Wealth and Inflation Effects in the Aggregate Consumption Function

   G.H. Holtham and H. Kato

36. The Government Household Transfer Data Base

   Rita Varley

37. Internationalisation of Financial Markets: Some Implications for Macroeconomic Policy and for the Allocation of Capital

   Mitsuhiro Fukao and Masaharu Hanazaki

38. Tracking the US External Deficit, 1980-1985: Experience with the OECD INTERLINK Model

   Pete Richardson

39. Monetary Policy in the Second Half of the 1980s: How Much Room For Manoeuvre?

   Kevin Clinton and Jean-Claude Chouraqui

40. Tax Reform in OECD Countries: Economic Rationale and Consequences

   Bob Hagemann, Brian Jones and Bruce Montador

41. A Revised Supply Block for the Major Seven Countries in INTERLINK

   Peter Jarrett and Raymond Torres

42. OECD Economic Activity and Non-Oil Commodity Prices: Reduced-Form Equations for INTERLINK

   Gerald Holtham and Martine Durand

43. Import and Export Price Equations for Manufactures

   Richard Herd

44. Price Determination in the Major Seven Country Models in INTERLINK

   Ulrich Stiehler

45. International Investment-Income Determination in INTERLINK: Models for 23 OECD Countries and Six Non-OECD Regions

   David T. Coe, Richard Herd and Marie-Christine Bonnefous

46. Recent Developments in OECD's International Macroeconomic Model

   Pete Richardson

47. A Review of the Simulation Properties of OECD's INTERLINK Model

   Pete Richardson

48. The Medium-Term Macroeconomic Strategy Revisited

   Jean-Claude Chouraqui, Kevin Clinton and Robert Bruce Montador

49. Are Commodity Prices Leading Indicators of OECD Prices?

   Martine Durand, Sveinbjörn Blöndal

50. Private Consumption, Inflation and the "Debt Neutrality Hypothesis" The case of Eight OECD Countries

   Giuseppe Nicoletti

51. The Effects of Monetary Policy on the Real Sector: An overview of Empirical Evidence for Selected OECD Economies

   Jean-Claude Chouraqui, Michael Driscoll and Marc Olivier Strauss-Kahn

52. The So-Called "Non-Economic" Objectives of Agricultural Policy

    L. Alan Winters

53. Alternative Solution Methods in Applied General Equilibrium
    Analysis

    Richard G. Harris

54. Tests of Total Factor Productivity Measurement

    A. Steven Englander

55. Quantifying the Economy-Wide Effects of Agricultural Policies: A
    General Equilibrium Approach

    Jean-Marc Burniaux, François Delorme, Ian Lienert, John P. Martin
    and Peter Hoeller

56. On Aggregation Methods of Purchasing Power Parities

    J.R. and M. Cuthbert

57. An International Sectoral Data Base for Thirteen OECD Countries

    F.J.M. Meyer-zu-Schlochtern

58. Empirical Research on Trade Liberalisation with Imperfect
    Competition: A Survey

    J. David Richardson

59. Eliminating the US Federal Budget Deficit by 1993: the Interaction
    of Monetary and Fiscal Policy

    R. Herd and B. Ballis

60. Compatible Trade and Production Data Base: 1970-1985

    Claude Berthet-Bondet, Derek Blades and Annie Pin

61. Ageing Populations: Implications for Public Finances

    Robert P. Hagemann, Giuseppe Nicoletti

62. The Economic Dynamics of an Ageing Population: the Case of Four OECD Economies

    Alan J. Auerbach, Laurence J. Kotlikoff, Robert P. Hagemann, Giuseppe Nicoletti

63. Modelling Housing Investment for Seven Major OECD Countries

    Thomas Egebo and Ian Lienert

64. Revised Groupings for non-OECD Countries in OECD's macroeconomic model INTERLINK

    Paul O'Brien, Laure Meuro, Arthur Camilleri

65. A Post Mortem on OECD Short-Term Projections from 1982 to 1987

    Byron Ballis

66. Potential Output in the Seven Major OECD Countries

    Raymond Torres and John P. Martin

67. Saving Trends and Behaviour in OECD Countries

    Andrew Dean, Martine Durand, John Fallon and Peter Hoeller

68. The Impact of Increased Government Saving on the Economy

    Richard Herd

69. The Information Content of the Terms Structure of Interest Rates: Theory and Practice

    Frank Browne and Paolo Manasse

70. On the Sequencing of Structural Reforms

    Sebastian Edwards

71. Modelling Business Sector Supply for the Smaller OECD Countries.

    Raymond Torres, Peter Jarrett and Wim Suyker

1990

72. The Role of Indicators in Structural Surveillance

73. The Saving Behaviour of Japanese Households

    Kenichi Kawasaki

74. Industrial Subsidies in the OECD Economies

    Robert Ford and Wim Suyker

75. Measuring Industrial Subsidies: Some Conceptual Issues

    Prof. Neil Bruce

76. The Dollar Position of the Non-U.S. Private Sector, Portfolio Effects, and the Exchange Rate of the Dollar.

    Bixio Barenco

77. Monetary Policy in the Wake of Financial liberalisation. (forthcoming)

    A. Blundell-Wignall, F. Browne and P. Manasse.

78. Indicators of Fiscal Policy: A Re-examination

    J. C. Chouraqui, R. P. Hagemann, N. Sartor