

The Political Economy of Public Debt

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I throat-clearing

It is an insight of conventional public choice theory that the information gathered about the *distributional consequences* of policies (in the normative assessment of those policies) can, under certain conditions, be mobilised to explain their political success. The “under certain conditions” proviso is worth emphasizing, because the conditions in question are in my view formidable. Specifically:

1. There has to be enough structure in the choice context that electoral equilibrium is well-defined (ie the dimensionality of the political domain has to be restricted to one, so that global cycling problems don't arise);
2. The ‘principal-agent problem’ that characterizes all systems of representative government has to resolve itself in favour of the citizen-principals. Otherwise, it is the preferences/beliefs of the political agents that are the predominant determinants of policy – voters’ preferences will play at best a subsidiary role;
3. The electoral preferences have to track individual interests sufficiently closely. That is, the “expressive” challenge to the conventional public choice account of electoral preference must be disposed of (or finessed). And rational ignorance problems must not be so great as to undermine voters’ assessments of where their interests lie.

It is no secret² that I consider these conditions a very major challenge to much of conventional public choice theory – particularly the part that deals with empirical applications, where the median voter theorem is the primary mechanism for deriving detailed hypotheses about specific policies. That said, just how well the median voter model does in explaining public policy outcomes is ultimately an “empirical question”. Here, I want to set the stage for exploring that empirical question. Specifically, I want to explore what would be at stake in applying that,

¹ I am grateful to Michael Brooks for assistance in the empirical test in section IV.

² Brennan and Buchanan (1980a) deals with the second. Brennan and Lomasky (1993) deals with the third.

more or less standard, median voter apparatus to the analysis of public debt.

There are three basic steps in the discussion. The first is to establish the likely distributional effects of debt financing. This is essentially a task in the “economics of public debt” and it will occupy me in section II. In section III, I shall extend the discussion to incorporate simple facts about the age-distribution of earnings so as to transform the public debt incidence question into one about demographic politics. These two sections form the core of the paper; but I conclude with a simple back-of-the-envelope empirical test of the central hypothesis that the theory produces. Presentation and discussion of that simple test occupies section IV. Section V draws some simple conclusions and offers some speculations based on what the paper suggests.

II The ECONOMICS

The history of doctrine about public debt makes an interesting study. I do not intend here to do more than trace its basic lineaments (and this only because doing so is broadly helpful for my purposes). But the last sixty years have been something of a roller-coaster ride in terms of the content of the prevailing professional consensus; and the story helps illustrate, in a number of different ways, the advantages of a “history of thought” perspective. The literature is littered with confident utterances of the kind: “well, we now know ...”, or “the latest research shows...” -- which turn out to be reversed by the professional consensus in relatively short order. The story is also full of episodes in which insights of earlier scholars were rediscovered (sometimes consciously, sometimes witlessly), wheels re-invented, earlier mistakes repeated – episodes of a kind that have the effect of heartening older scholars and buttressing us against the contempt of our younger colleagues!

In many cases, it’s not so much that what was taken as incontrovertible turned out to be wrong exactly – often enough, the scholars of the time provided the right answer to what was later perceived to be the wrong question. And that fact too is instructive, because it reminds us that working out the right question to ask, is itself a significant intellectual accomplishment.

The history divides itself conveniently into three phases, each of which can be conveniently summarized in terms of several core propositions that that school of thought took to be both valid and centrally relevant.

- a. *1945-1960, the Keynesian heyday:*
 - i. There is no real burden associated with (internal) public debt. The real burden occurs at the time when the expenditure is made: that’s when real resources are used up.

- ii. Internal debt is “debt we owe to ourselves”. It adds nothing to our real resource base. External debt is different: it does add real resources to the economy, and those resources will have to be repaid some time.
 - iii. Substituting public debt for current taxation has an immediate macro-expansionary effect: an increase in public expenditure financed by a tax increase invoked a different (lower) multiplier than does debt-financed public expenditure (and indeed, in macro terms, public debt invoked no contractionary force whatsoever!)
- b. 1960- 1974, *the Buchanan ‘recovery of the Italian theory’*³:
- i. Debt involves a postponement of the burden of taxation to future generations (future time-periods). There can be no burden at the time when the expenditure is made because bond-purchasers act totally voluntarily. The burden must be borne in the future when coercive taxation is levied to service and redeem the debt.
 - ii. “We owe it to ourselves” is an exercise in false aggregation – the “we” who owe and the “us” who we owe it to are different persons.
 - iii. Internal debt and external debt are the same in this respect.
 - iv. Because future taxpayers are not around to defend their interests, public expenditure will be predictably higher under debt. More generally, debt-financing is a violation of basic democratic principle – because it off-loads the cost of current expenditures onto the shoulders of a necessarily un-enfranchised future⁴.
- c. 1975 +: *Barro’s rediscovery of Ricardian equivalence*⁵:
- i. Debt involves an inter-temporal shift in the timing of tax payments; but if agents are rational, that inter-temporal shift will have no effect on their behaviour. Each will fully capitalise the future tax liabilities she faces into the present and spread the liability optimally across her total horizons independently of when the liability falls. The present is attached to the future either because each is herself one of the future taxpayers or because at the margin a dollar’s worth of reduced consumption by heirs is equivalent to a dollar’s worth of reduced own-consumption.
 - ii. Any real effect (including macro-stimulation) arising from debt financing (as distinct from tax financing) is a result of ‘debt-illusion’ – which rationality rules out.

³ Buchanan’s “conversion” to the Italian view, as he came down the stairs of the Hotel Angleterra, (after some months of studying the Italian literature on the subject) makes a wonderful story. But his realisation that the Italians were right and the Keynesian orthodoxy quite wrong reveals that up to that time he had more or less endorsed the Keynesian view. On this and more generally see Buchanan(1958/1999).

⁴ A nice collection of the literature up to that point is contained in Ferguson (1964). The literature is now vast.

⁵ See Barro (1974) and Ricardo (1820).

My sense is that the prevailing consensus is that Barro's logic is basically right – and that the debate revolves mainly now around whether and to what extent there *is* debt-illusion. Ricardo himself thought the equivalence theorem was 'valid in theory' but false in practice: Ricardo believed in debt-illusion. Barro, I take it, does not. But the extent of debt illusion is ultimately "an empirical question" – and that observation is, as George Stigler famously remarked, a terminal phrase in economics! As I read the situation, most scholars think that, though the empirical question may be open, the basic theoretical issue is settled.

But I think Barro's analysis is misleading; and his conclusions about public debt specifically quite wrong. His error arises basically because he asks the wrong question. The issue is *not* whether government bonds are net wealth or not. On that matter, Barro is surely right. Nor is the question settled by Ricardo's (correct) observation concerning the effects on the inter-temporal net consumption pattern of the timing of a given, fixed tax liability. Ricardo is surely right that a fully rational agent will respond identically to paying \$100 now or the present value of \$100 at some point in the future.

However, what is significant about debt-financing is not that it alters the time profile of tax *payments*: what is significant is that it alters the time profile of *tax rates*! And recognition of this simple fact makes obvious the inter-temporal substitution effects to which debt financing gives rise.

The Brennan-Buchanan model.⁶

Consider the following simple model.

There are two periods (present and future).

There is a given public expenditure, which is to be financed either by current taxes or debt. In the debt case, the taxes will be paid in the future period. So taxation means a tax rate profile $[t^*_c, 0]$; while debt means a tax rate profile $[0, t^*_f]$ where t^*_c and t^*_f raise the same present value of tax revenue.

The tax is a proportional income tax.

Initially assume that all taxpayers live across both periods (so that the question of inter-temporal transfers is strictly an inter-temporal one. We shall examine the inter-generational case briefly below.)

Begin by considering the *incidence* of the time-profile of tax rates; and do this by focusing initially on just two individuals: the training architect, A; and the professional boxer, B.

A is currently a university student with low current income but high expected future income. B has high current income, but boxers only have an effective life of 10 years. B's future income will be much lower than his

⁶ The analysis presented here is laid out in rather greater detail in a paper in *Finanzarchiv* that Buchanan and I published in 1980. It is a Buchanan view both in the sense that he co-authored the paper and in that the analysis provides a simple micro-economic foundation for the conclusions about the effects of public debt that he had defended in *Public Principles* in 1958.

current income. If the tax is imposed currently, A will pay little tax and B will pay a lot. If the expenditure is debt financed, A will pay a lot of tax; and B will pay a little.

More generally, the change in the time profile of tax rates alters the cost-sharing arrangements for the public expenditure across persons according to the time profile of their respective tax bases (in this case, income).

This observation in itself doesn't show that the future as a whole will be worse off under debt financing. If there is no debt illusion, all citizens will fully discount the future tax liabilities they face (as in the Barro-Ricardo model). But notice that under debt financing it will be better for each individual to be more like B and less like A – better, that is, for each individual to move income into the current period away from the future period. This means that there are diminished incentives to acquire human capital. And that diminished human capital means that everyone in the future tends to be worse off than they would have been under the current tax option.

The same basic story could perhaps more tellingly be told for the case of a proportional consumption tax. The ratio of current to future tax rates $[t_c/t_f]$ is lower under the debt option than under the current tax option: if the consumption tax rate is lower now and higher in the future, that encourages higher consumption now and lower consumption in the future – not via some perceived current 'income effect' (as might be associated with government bonds being perceived to be net wealth) but via a totally non-imaginary substitution effect towards the present and away from the future.

Consider now the inter-generational aspects of the time profile of tax rates. To the extent that the current generation seeks to leave a positive estate, and does so because the life-time consumption of heirs enters as an argument in the testator's utility function, then the foregoing argument goes through unscathed. At the margin, a dollar's worth of heir-consumption will be worth the same as a dollar's worth of own-consumption; and hence a higher tax on heirs' consumption (and a lower tax on own-consumption) will lead to smaller bequests. The point to be noted here is that the negative effects of debt financing on future generations does not depend on a desire on the part of the current generation to leave a negative estate. Even agents who desire that their "kids have it better than we did" will rationally respond to the inter-temporal substitution effects that debt financing involves.⁷

It would be possible to elaborate the foregoing simple model in a variety of ways – by dealing explicitly with different bequest motives; by allowing for expenditures other than the ones financed specifically by debt; by

⁷ That is, even if the size of bequest made exceeds the size of bequest received for each generation, changes in the time profile of tax rates will exercise a predictable substitution effect.

allowing for different possible tax bases; by postulating a specific time profile of aggregate income so as to estimate the precise relative values of t^*_c and t^*_f . However, none of these complications seem in any way to undermine the basic point – that changing the time profile of tax rates induces inter-temporal substitution effects and that these substitution effects involve the future having lower consumption/income than the present if public debt is used to finance current expenditure.

To summarize, proper analysis of public debt for fully informed fully rational agents, involves:

1. Recognizing that the effects of debt financing depend on analysis not of the inter-temporal pattern of given, fixed tax liabilities to each (a la Barro/Ricardo) but of the inter-temporal pattern of tax *rates*.
2. Recognizing that debt-induced changes in this inter-temporal pattern has substitution effects, which discourage human capital acquisition in the income tax case and discourages savings/investment in the consumption tax case.

The implication is that debt financing involves reduced capital accumulation and hence lower aggregate income in future periods. In that sense, debt does indeed impose a net burden on “future generations”. Debt-financing is also, as the Keynesians have always claimed, more fiscally stimulating than is current taxation – though probably not as stimulating as the Keynesians thought and for reasons the Keynesians themselves failed to articulate.

This analysis does not (of course) deny the possibility of debt illusion. It does point out that debt illusion is not required for future generations to be worse off than they otherwise would have been. Indeed, the effects of debt illusion are ambiguous: debt illusion weakens the substitution effect as it creates a perceived income effect. Whether debt illusion increases or reduces the burden on future generations is then an open question.

III the POLITICS

For the rational actor political theorist, the foregoing analysis is of interest not only in that it informs the normative assessment of debt as a fiscal instrument (whether from a Keynesian macro, or a inter-generational justice point of view – or both) but also in that it becomes an element in the explanation of the *use* of debt-financing. The idea here is to develop a simple application of the median-voter model -- applied specifically to the issue of the debt/tax mix that would predictably emerge in electoral equilibrium. Throughout, I shall reduce the exercise to a two-period comparison, taking it that in the second (future) period the debt will be redeemed with interest. I take the period to be fifteen years (roughly the half-life in discounted terms of a debt that is never redeemed).

Taking off from the earlier analysis, we can postulate for each individual an 'ideal' time-profile of tax rates, $[t_c, t_f]$ reflecting the time-profile of the individual's tax base (in what follows, we shall assume the tax is levied on income). Suppose initially that all individuals had the same time-profile of income. This would mean that their tax-cost-share in any public expenditure would be independent of time. Note, however, that in that case, individuals would not be indifferent as to when taxes fall. All would prefer to "tax smooth", reflecting the fact that the "excess burdens" ("welfare costs") of the tax system are a convex function of the tax rate.

We know, however, that all individuals do not have the same time-profile of income. Specifically, there is a specific age-profile of earnings that is systematic across developed economies. The pattern in Australia is quite typical of that in western countries – earnings rise with age to a maximum at around 50 and falling thereafter. The age-profile of income reflects that earnings profile; but of course, as earnings and age increase, savings increase and so the income from assets increases. Total income (earnings plus income from assets) rises to a maximum at an age somewhat older than 50, and declines thereafter, though not as fast as earnings do. My understanding is that the variance around this age-profile of income is quite small. I depict a stylised version of that age-earnings-profile in Fig 1.

The share of individual j in the cost of the expenditure is $Y_{j_c}/\Sigma Y_c$ if tax-financed and $Y_{j_f}/\Sigma Y_f$ if debt-financed. The ratio of debt burden to tax burden is Y_{j_f}/Y_{j_c} divided by the aggregate growth of income, $\Sigma Y_f/\Sigma Y_c$, which is common across all individuals. So, j will prefer a tax-rate mix such that $t_f > t_c$ if $Y_{j_f}/Y_{j_c} < 1$ and $t_f < t_c$ if $Y_{j_f}/Y_{j_c} > 1$. In short, the preferred 'time tax profile' for each will be a function of the ratio of tax base in 15 years time to tax base now – that is, Y_{15}/Y_0 .

We can conveniently divide the age distribution into several groups. There will be an age x such that $Y_{x+15} = Y_x$ – which from Fig 1 is at $x = 47$. Everyone younger than 47 will want a tax rate lower in the future than in the present, so will prefer tax financing at the margin. Over the range between 47 and 37 (52 – 15) the desired ratio of current to future tax will be smaller the older they are. Everyone younger than age 37 will desire the same time-tax-profile, which will involve a higher tax rate currently than in the future. Everyone aged between 47 and 65 will want the tax rate to be higher in the future.

The situation for those aged beyond 65 is complicated by the fact that the 'future time period' is that which applies after the citizen-voters in this age range expect to die. We must therefore say a little about motives for bequest (if any). There are three possibilities of interest:

1. The 'donor' cares about the lifetime consumption of her heirs (ie that lifetime consumption is the relevant element in the donor's utility function). In this case, whether the donor prefers to pay taxes now or have her heirs do so in 15 years' time depends on how old the heirs

will then be. It is certainly conceivable that the rational donor would prefer that taxes be levied now rather than in the future.

2. The individual has no bequest motive as such. She may prefer that any precautionary balances she will have at death be received by some persons rather than others, but her preference is to leave a minimal estate (consistent with uncertainty about the time of death). For such a voter, it is best to have taxes levied in the future because those taxes will fall upon persons whose consumption yields less utility to the 'donor' than her own.
3. The individual cares primarily about the size of her estate. She prefers that the money left goes to her specified heirs (rather than others) but the object that enters her utility function is just the size of the estate. In this case, too, she will prefer taxes to be levied in the future: that allows her to leave a larger estate (even though her heirs will be less well off than if the tax had been paid in the present. It is then worth noting that a systematic demand for debt-financing does not depend on the desire to leave a *negative* estate: it can also arise where there is a desire to leave a *positive* estate – where the object of preference is just the size of the estate.

It is worth noting that for groups 2 and 3 the general interest in tax smoothing is also affected. Members of those groups will prefer current tax rates to be zero, because the excess burdens that apply with high future tax rates are no less irrelevant than the direct tax burdens. In aggregate then, it seems plausible to think that the net preference of agents in the 65-plus age-range will be for a time profile of tax rates that is strongly oriented towards future taxes.

[It is also worth noting that, only for the latter group, is there any real sense in which the debt “passes the burden” to future generations as such. And though it is true that debt financing tends to leave the future less well off than it would be under tax financing, the process by which that comes about is primarily via the ‘incidental effects’ of debt on aggregate capital accumulation. Nothing we have said here rules out the possibility that the future may be on average very much better off than the present – that transfers to future generations at death may not be very substantial. In other words, whether debt-financing is an offense against the requirements of intergenerational justice seems to me to be independent of everything that we have said here: it is a function of the size of transfers to future generations, not the response of those transfers to the time profile of tax rates.]

On this basis, we derive the ideal tax rate ratio, t_c/t_f , for each age group – as indicated in Fig 2. And given the shape of that relation, it is clear that median debt-preference will correspond to that of the median age of the voting population. And this fact immediately gives rise to two comparative static propositions:

- (i) *over the relevant range*, as the age distribution of persons changes in favour of older persons so the preference for debt over tax financing increases *ceteris paribus*;

(ii) over the relevant range, countries with a higher median age can be predicted to have a higher preference for debt over tax financing, ceteris paribus.

IV a test?

I do not have great confidence in econometric studies – even ones of great theoretical and technical sophistication, of which the following is definitely **not** an example. Nevertheless, conducting very simple, back-of-the-envelope regressions is the kind of thing that the internet makes relatively costless these days; and it seemed worthwhile to me to investigate whether there was at least a weak presumption, one way or the other, in relation to the simpler hypotheses to which the theoretical discussion gives rise.

The exercise I have undertaken is as simple-minded as it is possible to be. Take a random selection of a dozen countries, for which data is readily available, making sure to include in the sample at least some of the ‘problem’ countries plus a few non-problem ones. Get for each of the countries the readily available data of median age and explicit public debt as a proportion of GDP; and then proceed to do a single line regression of the one against the other. It is easy to think of lots of ways in which this exercise falls short of what would be ideal, even within its own narrow compass. It is not the median age of the whole population but the median age of the citizenry that is relevant – and indeed, not the median age of those entitled to vote, but of those who actually vote (or who politicians believe are most likely to vote). It is after all well-known that electoral participation is a positive function of age (as well as education); so on various fronts, the median age of the actual population is at best a proxy for the age of the median voter. On the other hand, in the absence of any systematic factors suggesting that variability across countries, either in the relation between median age of those above voting age and median age across the whole range, or in the relation between age and voting propensity (of which a little more anon). For purposes of low level speculation, the readily available data can serve.

In the same spirit, I have chosen explicit public debt rather than the aggregate of explicit and implicit, partly because implicit debt data is more difficult to secure and partly because it is more speculative. Moreover, implicit debt involves not just a decision about the inter-temporal distribution of tax rates, but also of expenditure benefits – and future expenditures turn out to be capable of adjustment even where the commitments involved are quasi-contractual (as the German experience suggests).

The raw data are shown in Table 2.

Table 2

country	Median age	Public Debt/GDP (%)
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Japan	48.9	225.8
Italy	44.3	119
Germany	43.7	83.2
Greece	42.2	142.8
Belgium	42.0	96.8
Sweden	41.7	39.8
Spain	41.5	60.1
United Kingdom	40.5	76.5
France	39.7	81.7
Portugal	39.7	93
Australia	37.5	22.4
USA	36.8	58.9

The single equation:

$$\text{Debt/GDP}_i = c + \alpha M_i$$

yields values:

$$c = -471 \text{ (t-statistic -3.7)}$$

$$\alpha = 13.6 \text{ (t-statistic 4.5)}$$

$$R^2 = 66\%.$$

In other words, median age explains two-thirds of the variance in public-debt-to-GDP ratios! I confess I find this fact amazing – in large part for the reasons outlined at the outset of this paper. Of course, I accept that the result might be substantially modified by a larger sample of countries and by the addition of extra variables. I would certainly not want to assign the exercise any more authority than a first-round speculation. But viewed as a first-round speculation, it certainly suggests that there is something here worth exploring with heavier machinery.

The results indicate that a 1-year difference in median age is associated with a difference in public debt (in the same direction) of between 13% and 14% of GDP. Of course, those on the “high side” of the predicted value are exactly the expected suspects – Greece; Portugal; and the USA. There is room to “explain” the remaining one-third of variance by appeal to national profligacy and sub-standard fiscal institutions (as seems to be the instinct in much of the popular press, and not a little in the more serious literature.) But on the evidence here presented, the “main story” is a relatively simple public choice account, based on the distribution of interests within the electorate. To me that is astounding. But I guess it is encouraging news for public choice scholars of a conventional stripe.

V Conclusion

Public debt is an issue that is back on the agenda again.

In part, this is because the Global Financial Crisis (GFC) caused major reductions in tax revenues (both actual and expected) everywhere -- reductions that many fiscal systems could not sustain, given their already large levels of accumulated debt. In part, it is because there has been very

limited fiscal room for the kind of macro-response that the GFC demanded (or was seen to demand by both governments and citizens alike.) Of course, the real issue here is not so much the GFC itself but rather why so many governments accumulated such large stocks of debt in times of general prosperity. In other words, what demands an explanation is not the GFC but the generic propensity to create debt – and of course, public choice theory has had a long history of engaging just this question.

A related question, of more than local interest, is why Australia was such a spectacular outlier in this respect. Part of the Australian story lies in the fact that Australia avoided many of the worst features of the GFC, by courtesy of the Chinese economy and specifically China's demand for Australian minerals. But the more interesting part for the purposes of this paper is that Australia went into the exercise of fiscal response with a very low public debt. Is this because Australia had better policy advice and more fiscally responsible politicians than other countries (as many of those directly involved would doubtless claim)?

There is another possibility suggested by the argument in this paper – namely, that the median age of the Australian voter is rather lower than for other countries by virtue of compulsory voting in Australia. This would be a more telling suggestion were it not for the fact that Belgium is also a country with compulsory voting (and hence a younger electorate); Belgium seems to be pretty well “debted up”.

In any event, what I see as the main conclusions of this paper are as follows:

1. The current conventional wisdom (or what I take to be the current conventional wisdom) in economics concerning the incidence of the public debt is faulty. Proper analysis requires debt to be identified as changing the time profile of tax rates rather than the time profile of tax payments.
2. When that error is corrected, there is a natural transition to a form of demographic politics – one in which the interests of different age groups track the time profile of tax rates. Broadly, the older one is, the more one will prefer to postpone taxation to the future.
3. This fact is more driven by the age-profile of income than it is by the fact that some individuals “seek to leave a negative estate”. Indeed, an incidental message of this paper is that even where *no-one* seeks to leave a negative estate – in particular, even where a larger estate is positively valued – older individuals can still desire that current tax rates be reduced and future ones correspondingly increased.
4. Preliminary empirical tests of the country-comparison kind indicate that there is considerable explanatory power in the simple median voter hypothesis that emerges from the analysis.

A final thought. Since the median age of the population is increasing, the logic of the argument here suggests that debt is a phenomenon that is not going to go away anytime soon.

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Income

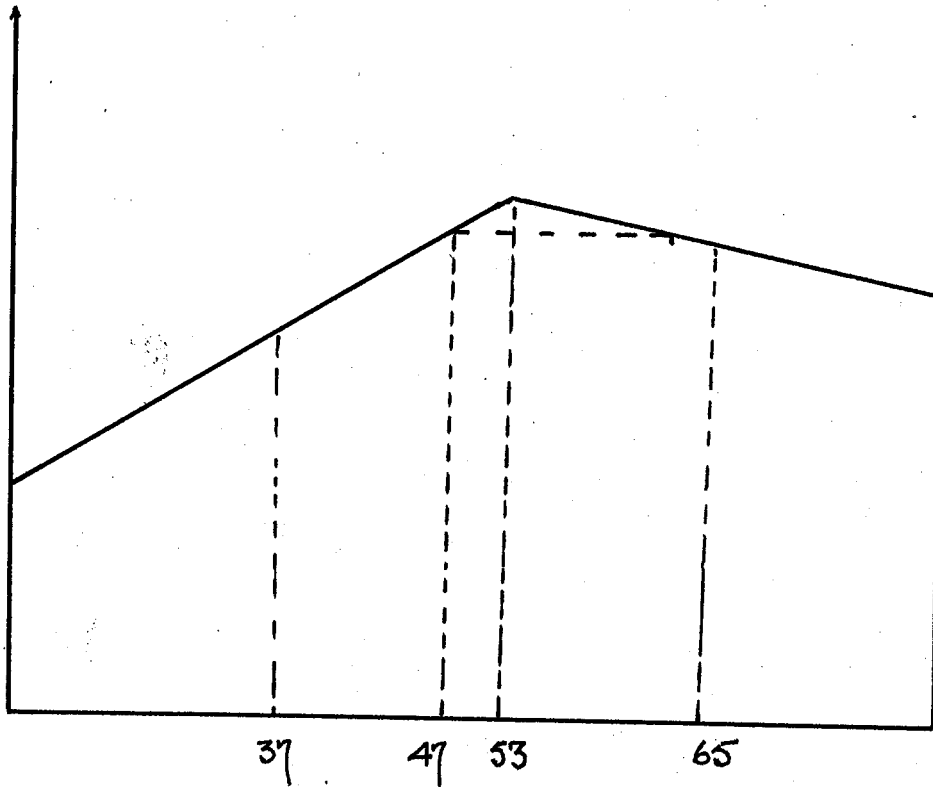


Fig 1
Age Profile of Income (tax Base)

Ideal t_c/t_p

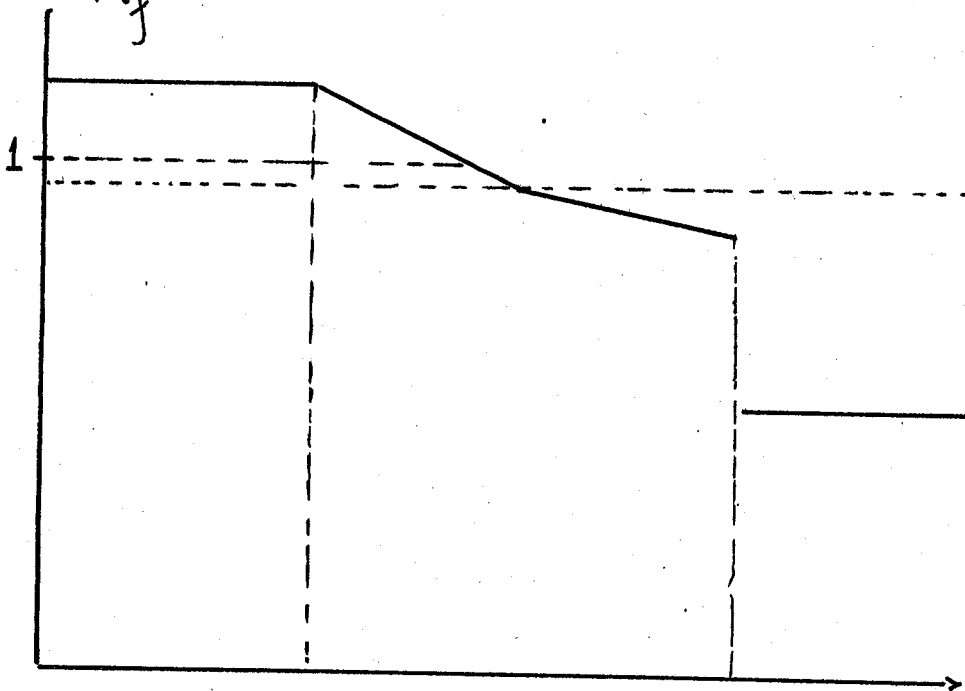


Fig 2
Age Profile of Desired tax-rate profiles