

# **THE DEVELOPMENT OF SOME CHARACTERISTICS FOR EQUITABLE NATIONAL RETIREMENT INCOME SYSTEMS**

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## **Abstract**

The objective of this paper is to establish a set of characteristics or benchmarks that is required for a total retirement income system to be considered equitable. It must be stressed that the criteria suggested do not, by themselves, design a national retirement income system and indeed they may be satisfied by a diverse array of retirement income systems. Furthermore, they do not dictate a particular design nor a level of benefits or contributions as each of these must be decided within the political, historical, economic and cultural context of each country. However in putting forward these criteria, the aim is to develop clear distinctions between equitable and inequitable national retirement income systems.

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## **1 INTRODUCTION**

The provision of income to retired persons is subject to much debate and reform throughout the world with Governments of countries at all stages of economic development expressing considerable interest in the topic and, in some cases, making far reaching decisions. The reasons for this significant awakening of interest in the development of national retirement income systems or programs during the last ten years varies between countries but some of the following factors have been important:

- An ageing population has placed increased financial pressure on existing, and in some cases over generous, national retirement income programs;
- An ageing population has also meant that, in democratic societies, the votes of the aged population have become more important;
- Increasing longevity has placed additional financial strains on all systems providing retirement incomes;
- Lower saving rates in many countries have required Governments to consider options to increase private sector savings and/or reduce public sector expenditure;
- Changing employment patterns has led to an increase in early retirements and greater flexibility in the labour markets;
- The impact of inflation during the 1980s (in particular) on the value of pensions in payment;
- International pressure has forced some countries to adjust national systems to reflect a desired norm;
- The decline of family and other informal support structures together with increasing urbanisation has meant that many countries are now introducing a national arrangement for retirement incomes; and
- The problems of evasion, particularly where contributions rates have risen to match increasing liabilities.

There is no doubt that the simultaneous influences of some of these pressures have forced many Governments to review their national retirement income systems. In

general terms, these systems represent a combination of the following three pillars of retirement income:

1. a pension from a Government system which may be a flat rate benefit (universal or means tested) and/or a benefit that is related to the level of contributions/taxes paid by the individual throughout his/her lifetime;
2. a benefit (in pension or lump sum form) paid from a tax-supported pension, provident or superannuation fund administered and invested in the private sector and, in many cases, linked to the individual's employment history; and
3. a benefit from personal savings beyond any mandated level which may be invested within or outside the tax-supported retirement income system.

The possible permutations and combinations of these three pillars in the design of a total retirement income system within a particular society are considerable and it is not the intent of this paper to assess the value of each pillar and the contribution that it should make towards a retirement income system. Rather, we will endeavour to ask a fundamental question:

*“What characteristics should be present within an equitable national retirement income system, after allowing for all components (or pillars)?”*

For instance, it is often suggested that a fair system will ensure a minimum level of income for all those above a certain age. However are there other criteria necessary in an equitable system?

The World Bank (1994) suggested that its recommended three pillar arrangement would “insulate the system from political pressures for design features that are inefficient as well as inequitable” (p23).

However, it did not spell out its criteria for equity. Nevertheless, it suggested that any national scheme is not sustainable in the long term if it is inequitable.

It is also apparent that these systems must have a long term perspective as they are assisting or requiring individuals to set aside funds during their working years so that they will receive income in the future. Hence, in terms of fairness, it is critical that these systems are considered from both the intra generational and inter generational perspectives.

In Section 2, actuarial and economic views about equity are considered in the specific context of national retirement income systems. Notwithstanding their different starting points, some of the judgements about equity are common to these two perspectives.

In Section 3, particular criteria are proposed which can serve as criteria to assess equity in national retirement income systems. In doing this, it is acknowledged that the specification of these criteria must reflect value judgements about what is equitable and also important. However, it is suggested that whilst there will be no universal answer to the problem of specifying equity, the problem is so important that it cannot be avoided. It is also contended that many groups (including actuaries, economists and sociologists) can, and indeed should, make significant contributions to the process of specifying equity so that additional insights can be gained from the use of a range of analytical frameworks.

Section 4 sums up the paper and presents the conclusions.

The criteria advocated in this paper are sufficiently broad that a range of retirement income systems may satisfy them. They do not dictate a particular design or a level of benefits or contributions, as each of these must be decided within the political, historical, economic and cultural context of each country. However in putting forward these criteria, the aim is to develop clear distinctions between equitable and inequitable national retirement income systems.

## **2 EQUITY IN NATIONAL RETIREMENT SYSTEMS**

The aim of this section is to examine some of the concepts of equity which have appeared in the actuarial science and economic literatures in relation to national retirement income systems.

### **2.1 Actuarial concepts**

There is a fundamental difference between the actuarial concept of equity in private insurance and the actuarial concept of equity in national retirement income systems.

In a seminal article, Hohaus (1938) argued that private insurance and social insurance programs have different objectives and different characteristics, and as such, it is inappropriate to apply a private insurance standard of equity (where benefits are actuarially related to contributions) to social insurance schemes. His premise is that as the primary purpose of social insurance is to meet society's desire to ensure an adequate minimum income for all members, considerations of adequacy should assume more importance than considerations of equity. This emphasis is also consistent with the World Bank Report (1994) which suggested that the public pillar (as distinct from any private sector pillar) should have the limited objectives of alleviating old age poverty and coinsuring against a multitude of risks and should not be primarily concerned with the saving function.

In contrast to social insurance, Hohaus argues that the primary objective in private insurance must be to ensure equity. This is because private insurance, which is voluntary, will collapse as participants will opt out if they are not treated fairly.

Hohaus also acknowledges that fairness in social insurance schemes may be interpreted in many different ways, depending on the balance between adequacy and individual equity. He describes the relative importance of adequacy and equity in social insurance in the following terms:

“...its first objective in the matter of benefits should, therefore, be that those covered by it will, so far as possible, be assured of that minimum income which in most cases will prevent their becoming a charge on society. Not until this is accomplished should financial resources (whatever, if anything, may remain of them) be considered as available to provide individual differentiation aiming at equity” (Hohaus 1938).

Of course, the issue of strict actuarial equity does not arise in a publicly funded scheme where the first pillar is primarily concerned with provision of a base income and is paid from general taxation revenue. An example of this structure is the existing Australian age pension where no special Social Security contributions exist and there are no earnings related benefits.

In a subsequent article, Hohaus (1955) addresses the appropriate combination of adequacy and equity and notes that more adequacy should be used than equity, but that the appropriate balance between adequacy and equity should be assessed in terms of the coverage and financing of the system. He argues that the more universal the system, the less importance need be accorded to equity, subject to the qualification that where the system is financed in part by the contributions of potential beneficiaries, some equity should always be included. He also considers the definition of adequate incomes, arguing that this depends on the particular society and particular economic conditions. By so doing, he implicitly acknowledges the importance of social, political and economic factors in determining the appropriate balance between adequacy and equity.

Hohaus’s premise that different concepts of equity are appropriate to private insurance and compulsory social insurance schemes is shared by Gillion (1983). Referring to the distinction between compulsory pay-as-you-go schemes of a redistributive nature and funded schemes of a savings nature, Gillion argues that it may be appropriate to recognise different objectives for the different schemes with a suggestion of “Equality under the former (i.e. compulsory) and equity under the latter (i.e. funding)”. Gillion also recognises that pension provision differs between countries and that what is relevant in one country may not be appropriate in another.

The different objectives of private insurance and social insurance schemes, and the different implications for equity, are also considered in the UK Report of the Joint Working Party on Discrimination in Insurance and Pensions (1988). This report argues that in compulsory collective insurance (where claims are effectively met by the government through a compulsory tax) there is no need for any relationship between individual risks and taxes, whereas any voluntary scheme must entail the private insurance concept of equity.

It is argued elsewhere in the actuarial literature that it is inappropriate to apply other private insurance concepts to social insurance schemes. For example, several commentators on Steiner's (1983) proposal that the American public pension system should adopt an actuarial funding approach argue that different definitions of "actuarial soundness" are appropriate to private insurance and social insurance schemes.

As well as the concepts of equity considered above, the actuarial science literature includes the principle of "group equity" formulated by Myers (1993). This principle requires that social insurance schemes should provide similar benefits to individuals in similar circumstances. As such, it is very similar to the economic concept of horizontal equity.

Some actuarial studies on national schemes have adopted a "money's worth" perspective, comparing the returns received by different groups of individuals (for example, high income earners, average income earners and so on) retiring at different times (Myers and Schobel, 1983, 1993) without addressing the question of whether the benefits are adequate. Notwithstanding this application of an actuarial approach, there is broad agreement that such a standard should be largely irrelevant for a publicly funded retirement income scheme. The reasons cited include the social insurance basis of a national scheme and the limited importance it ascribes to equity (Foster & Nichols, 1993); the failure to apply a "money's worth" standard to other government programs (Robertson, 1983); and the other social purposes served by social security (Myers and Schobel, 1983, 1993).

It is interesting to note that in its submission to the Senate Select Committee on Superannuation, The Institute of Actuaries of Australia (1994) suggested that a retirement income system should aim:

“for financial equity amongst those who contribute and amongst different generations, whilst ensuring that adequate provision is made for non-earners and low earners.” (p24).

This objective highlights the actuarial approach to equity for individual contributors and groups (that is,. generations) whilst also recognising the social objective of adequacy, as defined with a minimum income.

Hence, it is apparent that the actuarial approach to equity in national retirement income systems does not have the same “narrow” formulation as is required in private insurance. Rather, the private insurance concept of equity is modified by the recognised social need for a level of minimum income, with the result that individual equity is no longer the dominant principle. This contrast is ultimately based on the recognition by actuaries that there is a fundamental difference between the objectives of market based insurance contracts and those of national social security systems. As a result of this fundamental difference, the application of equity criteria is also different.



## 2.2 Economic Concepts

### 2.2.1 Introduction

The economic literature has given most consideration to the public component of national retirement income systems; that is, where benefits are provided from taxation or specified contributions. Yet the economic literature reveals a number of different ideas on equity in these systems.

However, before discussing these alternatives, it is helpful to distinguish two broad forms of the public component of national retirement systems, namely the “Bismarckian”<sup>1</sup> and the “Beveridgean”<sup>2</sup> approaches. According to Pestieau (1994):

“The first involves benefits linked to earnings and to contributions and is therefore in the spirit of insurance; the second implies flat-rate benefits and is very close to a pure redistributive scheme with a basic and uniform allowance that is awarded on the basis of specified contingencies.” (p 83)

Spicker (1993) further highlights the fundamental differences between these two approaches. He notes that if payments are to be made on the basis of insurance, they must be financed on an actuarial basis but that, in contrast, an earnings related contribution basis should not be used to provide a universal minimum benefit as some individuals will be unable to contribute whereas for others, an earnings related contribution to provide a flat rate benefit is nothing more than a concealed tax.

Naturally, these different approaches are also associated with different equity standards. The “individual equity” is considered important in the Bismarckian approach whereas the dominant standard in the Beveridgean approach is one of “social adequacy” which seeks to ensure that no one falls below a specified minimum income level.

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<sup>1</sup> This approach is named after Prince Bismarck who introduced some of the first social insurance arrangements in the world into Germany during the 1880s.

<sup>2</sup> This approach is named after Sir William Beveridge who wrote a report on Social Insurance for the UK Government in 1942.

Before leaving this brief discussion, it is worth noting that changes occur within countries over time. For instance, although Beveridge abhorred the adoption of an earnings related principle, the United Kingdom introduced such a scheme in 1959, less than two decades after the Beveridge Report. An opposite reversal occurred in Germany where the first draft of the Bismarck Bill in 1887 included low flat rate contributions but the eventual bill passed in 1889 included graduated contributions.

### *2.2.2 Matters for Particular Societies*

The economic literature demonstrates consensus that decisions about the selection and prioritisation of the objectives of national retirement income systems can only be made by the particular society. Empirical support for this proposition is provided by the results of a survey in Pestieau (1994) which asked Europeans to choose between a minimalist and a maximalist approach to social protection. The minimalist position was expressed in terms of :

“The government should provide everyone with only a limited number of essential benefits and encourage people to provide for themselves in other respects”,

whilst the maximalist position was expressed in terms of

“The government must continue to provide everyone with a broad range of social security benefits even if it means increasing taxes and contributions”.

The results showed that whilst more people in each of the twelve European countries surveyed supported the maximalist position than the minimalist position, there was considerable variation between countries. Support for the maximalist position was highest in Portugal (82%) and lowest in the Netherlands (53%) while support in Denmark for the minimalist position (54%) was double that in Germany and Luxembourg (27%). These results, coupled with a finding in the same survey that a majority of respondents supported lower taxes and contributions, indicate that different countries prefer different approaches and attest to the complexity inherent in resolving those preferred approaches.

### 2.2.3 *Intergenerational equity*

Intergenerational equity is considered in different ways in the economic literature, with the various discussions highlighting the complexity of the subject. The various studies (for example, Boskin et al 1987, Steuerle and Bakija 1994) which have investigated inter-generational redistribution have concentrated on comparing the returns (for example, rates of return and/or transfers) received by different generations or cohorts. As the World Bank (1994) notes, all cases show that earlier generations have done better than later generations as the introduction of these schemes tend to favour those near or past retirement who do not have the capacity to contribute.

Thompson (1983) notes that how one interprets these results depends on the intergenerational equity standard that is used. Drawing upon private sector pension plans, Thompson uses the analogy of defined benefit pension plans and defined contribution pension plans. In the former, prior contributions made by or on behalf of the beneficiaries are not considered in the determination of benefits, whilst in the latter, benefits are determined solely on the basis of prior contributions and investment earnings. Thompson notes that the current American social security system is a defined benefit plan and repeats Myers' argument that the observed pattern of higher returns to earlier generations does not constitute evidence of intergenerational inequity, but rather is in accordance with what would be expected in a maturing private sector defined benefit plan, irrespective of whether or not that plan was fully funded. According to Thompson, it is a situation where the adoption of the defined contribution pension plan standard of equity produces one set of equity implications, whereas the adoption of the defined benefit pension plan standard produces another set.

Dilnot et al (1994) contend that there is no reason why the rates of return should be the same for all generations, arguing that rates of return should differ in line with population and real economic growth. This bears some similarity to the argument that the observed pattern of returns should be evaluated in the context of general economic conditions.

Thomson (1991) adopts a generational approach in his examination of the development of government arrangements to promote the welfare of New Zealand society. This shows that the balance of contributions and benefits has been (and will be) very different for different generations. In advancing reasons for this, Thompson establishes that intergenerational exchange is complex, being determined by a variety of demographic, political, economic, sociological and institutional factors, including the characteristics of the welfare state itself. Thompson's work demonstrates the importance of comprehensive generational accounts in identifying and monitoring intergenerational transfers, a point also noted by Auerbach et al (1994) and the World Bank (1994).

#### *2.2.4 The Australian exception*

Much of the economic literature has been concerned with the American and other national retirement income systems where there is a formula linking the level of pension received by an individual and the amount of personal contributions. The Australian scene is fundamentally different as there is a means tested age pension, no targeted Social Security contributions and no earnings related benefits. In essence, the only benefit paid by the Australian Government is the means tested age pension that has as its primary objective, the alleviation of poverty. In essence, this position reflects Beveridge's view that provision above the minimum should be the individual's responsibility. However, even this 'pure' system has been affected by the introduction of a compulsory system, administered in the private sector, where individuals' benefits are directly linked to the level of contributions made by the employer on the employee's behalf.

#### *2.2.5 Other issues that affect equity*

Aaron (1977) notes that whilst it may be intended that the public component should be progressive, the actual effect of the system may be quite different due to differences between various economic groups. For instance he found that differential mortality (where life expectancy is positively related to lifetime income) caused the nominally progressive American Old Age Insurance system to favour higher income earners over

lower income earners. Furthermore, differences in the age of entry into the labour force, associated with differences in educational attainment, reinforced this effect. The importance of differential mortality in terms of the equity of other national retirement systems has also been noted (Creedy, Disney and Whitehouse, 1993) while Knox and Tomlin (1998) have recently confirmed its existence in Australia. Brown (1998a) has considered the impact of different mortality for both the US and Canadian Social Security systems and, whilst acknowledging its clear impact, concluded that the progressive features built within the two systems were sufficient to more than offset the regressive effects of differential mortality.

Different patterns of behaviour exhibited by different groups also have equity implications. Achenbaum (1986) contends that whilst the same rules apply to all participants, differences in lifetime experiences mean that these rules have different effects on different groups. For instance, the rules of the American social security system are based on the employment and earnings profiles of “average” white men, which disadvantages those groups such as women and minorities, who typically have different profiles. In Australia, Rosenman and Winocur (1991) have suggested that Australian women are disadvantaged by occupational pension arrangements as a result of their different patterns of labour force participation and the organisation of occupational pension systems on an individual rather than household basis which does not recognise their non-monetarised activities.

Different patterns of behaviour also have equity implications. For example, Atkinson et al (1994 and 1995) found that the progressivity of the Australian national retirement income scheme was sensitive to the investment decisions made by individuals at retirement whilst Collins and Richardson (1984) argue that the exclusion of particular categories of assets from the Australian pension means test discriminates, inter alia, against certain types of retirement activities and against particular types of residences. Actual retirement ages can also affect equity. Bateman et al (1994) have noted that Australians who retire as soon as they are eligible receive larger benefits (in terms of the total present value of the age pension) than those who continue to work.

### **2.3 Conclusions**

The literature relating to equity issues in national retirement income systems recognises the need to balance both the social adequacy and individual insurance aspects. Virtually all national retirement income systems involve some combination of these components, even if some of the individual insurance aspects may be administered in the private sector. This mixture means that most writers (for example Reynaud, 1998) acknowledge the necessity for an equitable retirement income system to represent a balance between the need for adequate incomes and the concept of solidarity (often through the provision of a minimum pension) and individual equity, based on the insurance analogy of expected benefits and contributions. In addition, it is recognised that there is a need to consider equity between generations as well as within a particular generation.

### **3 ESTABLISHING THE CHARACTERISTICS**

#### **3.1 The Objective**

This brief review of the literature has shown that equity is a concept which is fraught with difficulty in that it is vague, variable and value laden. Therefore any conclusions about equity in national retirement income systems must contend with this problem together with the variety of systems that exist and the different ways in which they may be analysed. Notwithstanding these problems, the aim of this paper is to use the insights provided by this review of the actuarial and economic literatures to develop a set of equity criteria which may be used to assess whether or not a particular national retirement income system is equitable. Inevitably, the specification of these particular equity criteria has necessitated value judgements and others, with different values, may make different judgements about how to assess equity in national retirement income systems. Nevertheless, equity is of such fundamental importance that it is essential that efforts be made to specify how equity may be assessed in national retirement income systems.

#### **3.2 Characteristics of an Equitable National Retirement Income System**

*1. An adequate minimum income should be provided for all retirees*

The provision of an adequate minimum income for all is consistent with Hohaus' concept of social adequacy. It is also consistent with the dominant standard applied to Beveridgean systems and to some aspects of Bismarckian systems. There is also broad agreement in the literature that the adequate minimum income cannot be prescribed but must be determined by each particular society in the context of the prevailing economic, social and political conditions. As will be noted later, the level of this minimum must also be linked to the issue of long-term affordability.

2. *Outputs (for example, retirement benefits) should be related to inputs (for example, lifetime contributions/taxes)*

The premise that outputs should be related to inputs is consistent with the importance accorded to individual equity in Bismarckian systems. The aim of this criterion is to ensure that those who contribute more, receive more. This is not the same as saying that the system should be actuarially fair in the private insurance sense. Again, there is broad agreement that there is no single prescribed relationship between inputs and outputs, but that the appropriate relationship must be determined by each particular society. It should also be noted that this relationship could occur in either the private or public sector or within both sectors in a complementary manner.

3. *Redistribution should be progressive*

The provision that redistribution should be progressive (that is, from high income earners to low income earners) acknowledges the importance accorded to issues of vertical equity in the economic literature. Concern about intragenerational transfers is also evident in the actuarial science literature.

Reflecting findings that differential mortality may cause the actual form of redistribution to differ from that intended, it is advocated that the redistribution should be sufficiently robust to withstand the impact of differential mortality. The extent of redistribution is, however, a matter for each particular society. It is also important to note that an excessive level of redistribution is likely to impact on personal incentives, an efficient allocation of resources and economic growth. Hence, there is likely to be a maximum level of redistribution that is feasible within any society at a particular time.

4. *Similar benefits should be provided to individuals in similar circumstances*

The requirement that similar benefits should be provided to individuals in similar circumstances is consistent with the criteria of group equity and



horizontal equity which are evident in the actuarial literature and economic literature respectively. This requires that arrangements should not favour one group of individuals over other groups who are in similar financial circumstances (for example, the self employed and employees).

In contending that issues such as the level of an adequate minimum income, the appropriate relationship between inputs and outputs and the extent of redistribution are matters for each particular society, we are seeking to ensure that the decisions which are made are considered “fair” by each particular society. This approach implicitly requires that national retirement income systems must be clear and comprehensible as a society is unlikely to accept a system as fair if it cannot be understood. That is, transparency should also be considered to be an important feature of any system.

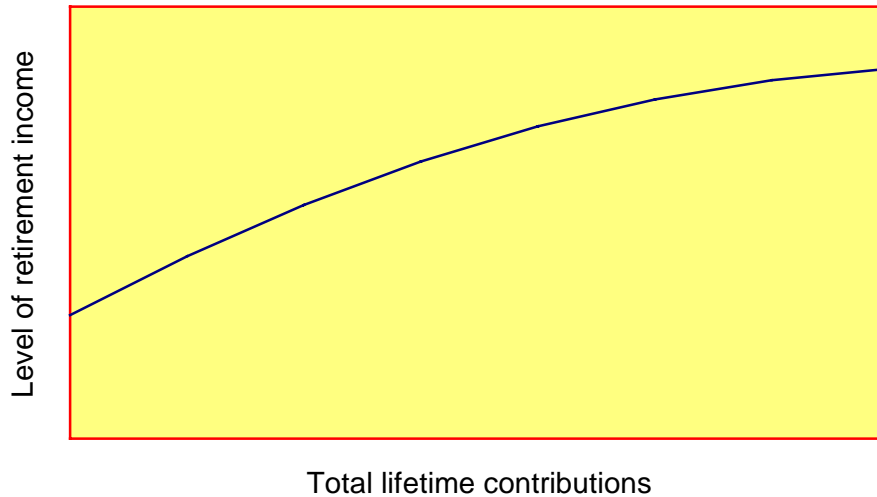
The above equity criteria do not directly address the issue of intergenerational equity as it is argued that the desired degree of intergenerational equity is a matter for each particular society. Notwithstanding this, these equity criteria are sufficiently broad so as to be capable of being satisfied by national retirement income systems with differing degrees of intergenerational transfers.

It is also important to stress that these criteria apply to a system “as a whole” and not necessarily to each individual component within a system. Indeed, it is likely that a particular component within a system will not meet each of the criteria.

### **3.3 Graphical Representations**

The first three of these four criteria can be satisfied where the relationship between an individual’s lifetime contributions and the ultimate value of retirement income within a particular retirement income system is as shown in Figure 1.

**Figure 1: An equitable relationship between lifetime contributions and retirement incomes**



Alternatively, if we let:

RI equal the level of total Retirement Income; and

C equal the level of total lifetime Contributions, then

1. there exists a minimum RI when  $C = 0$ , thereby providing a minimum income for all;
2. the first derivative of RI with respect to C is positive, indicating that as Contributions increase so does Retirement Income. However, it is also noted that the value of the derivative should not fall below a certain value K, to ensure that a level of incentive remains within the system; and
3. the second derivative of RI with respect to C is negative, indicating that the curve has a concave shape, such that a defined increase in Contributions provides a smaller increase in Retirement Income as lifetime income increases.

Figure 2 expresses the same result but this time, in terms of the individual's net income replacement rate after retirement. It shows that as the individual's lifetime income increase, the net replacement rate declines.

**Figure 2: An example of an ideal shape for replacement rates**

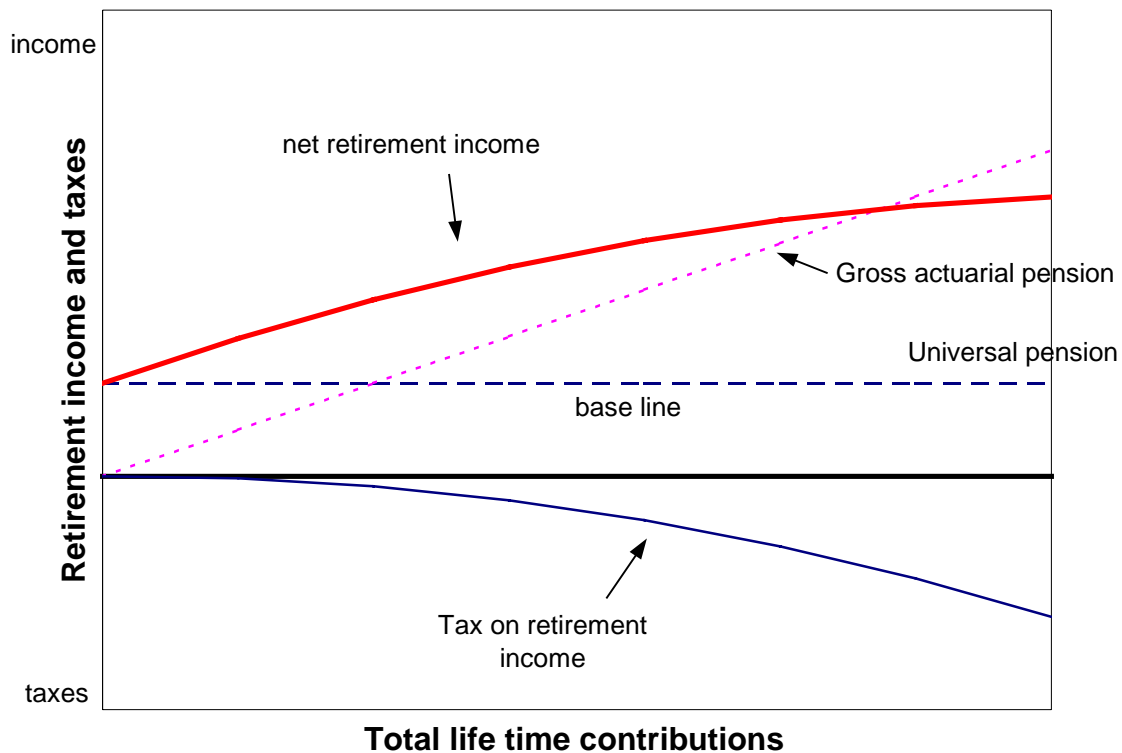


A variety of national retirement income systems may satisfy these criteria and thus be deemed to be equitable. One example is a national retirement income scheme based on a level universal public pension supplemented by pensions organised on an actuarial basis. For the purposes of this paper, it is assumed that these “actuarial” pensions could be organised within the private and/or public sectors. The actual level of the universal public pension would be set so as to ensure that all retirees received an adequate minimum income, whilst the “actuarial” pension would ensure that there is a relationship between lifetime contributions and retirement benefits. Such a scheme would also deliver similar benefits to individuals with similar patterns of lifetime contributions.

It is envisaged that this scheme would operate within the context of a progressive system of taxation. The scheme could also be constructed to produce the desired level of

funding within the overall system by ensuring that the tax on the “actuarial” pension financed the desired level of the universal public pension. A schematic representation of a national retirement scheme based on a level, universal public pension supplemented by “actuarial” pensions is shown in Figure 3. It should be stressed that Figure 3 does not advocate a particular level of universal pension but rather indicates the net result of the combination of a universal pension plus an actuarial pension related to lifetime contributions minus a level of progressive income tax that is related to the level of total retirement income.

**Figure 3: A universal pension plus an 'actuarial' pension**



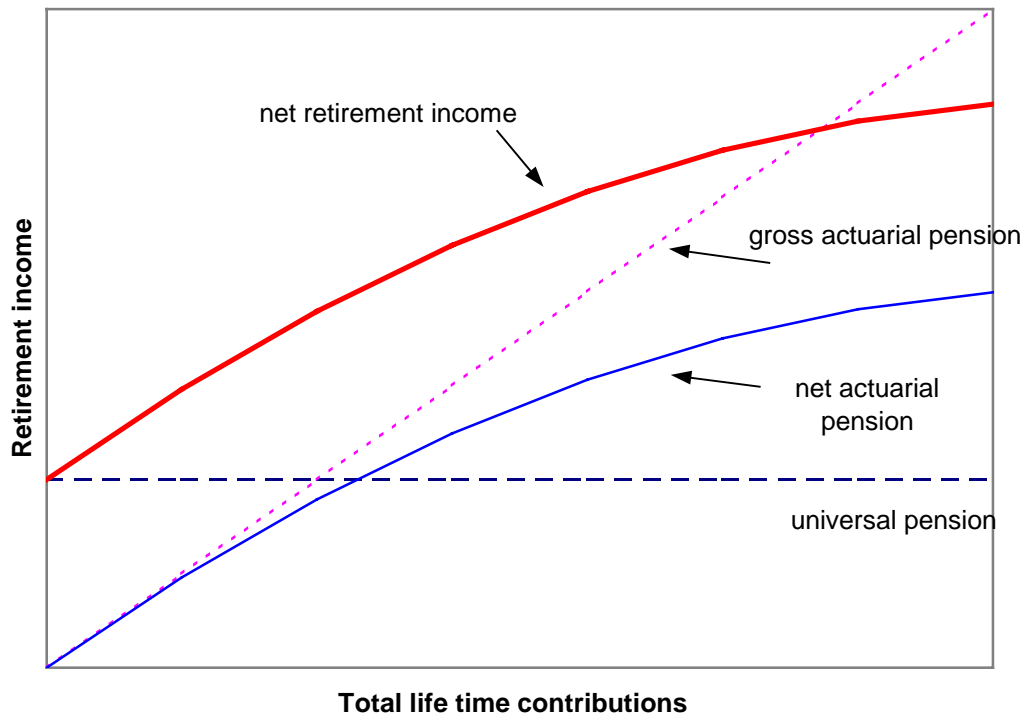
However, this is not the only type of national retirement income scheme which is capable of satisfying the equity criteria set forward. Another example is one based on a compulsory contributory national retirement scheme where there is a progressive relationship between retirement benefits and lifetime contributions. This would mean

that as lifetime incomes (and thus lifetime contributions) increased, beneficiaries would receive a progressively lower proportion of the actuarial value of their lifetime contributions. Many Social Security programs are based on this approach. As it would be necessary to ensure that those with lower lifetime contributions received adequate retirement benefits, those with low or zero lifetime incomes (and thus, low or zero lifetime contributions) are likely to receive retirement benefits which exceed the actuarial value of their lifetime contributions. This would be financed by transfers from those with higher lifetime incomes, through the application of an appropriate formula.

This type of system would satisfy the four broad equity criteria in that it would deliver adequate minimum incomes; there would be a relationship between lifetime contributions and retirement benefits; redistribution would be progressive; and individuals in similar circumstances (in terms of lifetime contributions) would receive similar benefits. Figure 4 illustrates this alternative. It should be noted that the taxes which are shown explicitly in Figure 3 are implicit in the arrangement shown in Figure 4. This arrangement could realistically be administered only in the public sector or in the private sector, if a government subsidy were provided.

Brown (1998b) compares the US and Canadian schemes which are based on this general approach. He notes that while there are considerable differences in emphasis, formulas and structures, the resulting benefits are very similar. This finding highlights the fact the end result can be achieved in a number of different ways.

**Figure 4: A national scheme with implied taxes**



A national retirement income scheme based on a means tested public pension, supplemented by ‘actuarial’ pensions (from the public or private sector) may also satisfy these criteria and thus be deemed to be equitable. However, it is difficult to construct such a scheme that satisfies the four criteria outlined above. A major reason for this is the difficulty to ensure that such a scheme delivers similar benefits to individuals in similar circumstances. This requires that “similar circumstances” be defined and incorporated into the means test which generates problems such as:

- the definition of the assets and/or income to be included in the means test;
- the assessment of the item(s) included (for instance, if income is included, should this be on a lifetime or current year basis and if assets are included, should all assets be included or only certain types of assets); and
- the appropriate treatment of assets and/or income.

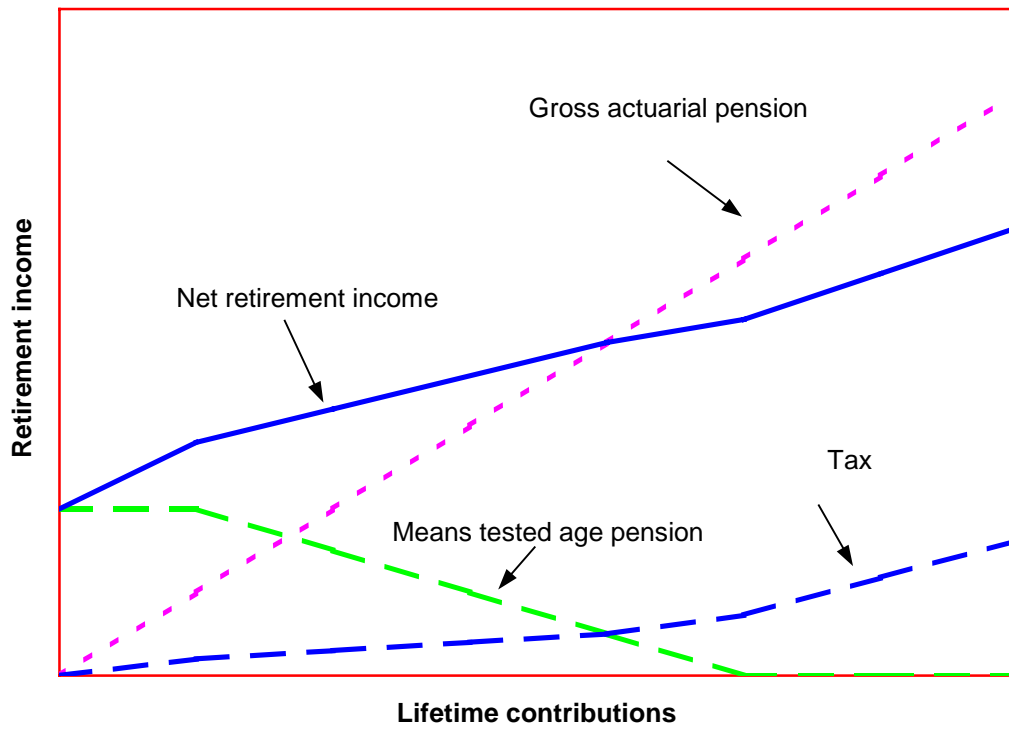
Further problems arise from the interaction between the ‘actuarial’ pension system and the taxation system, not the least of which is the difficulty in ensuring the appropriate

relationship between the impact of the taxation system on actuarial pensions and that of the means test on the public pensions. This is particularly difficult, given that the two systems may have different time scales with the means test based on annual income and/or assets (post-retirement), whilst taxation of the actuarial pension system may be based on lifetime contributions (pre-retirement) and/or fund income (pre-retirement) and/or benefits (post-retirement).

Figures 5 and 6 show two examples of the net retirement income with the presence of a means tested age pension. They highlight the need to relate the taxation of the gross retirement income to the effect of the means test on the public pension. Figure 5 does not result in a concave shape (the third criterion) although it attempts to provide a reasonable pension-taxation link. Figure 6 has a much steeper tax increase when the pension ceases and the overall shape is thus improved. However, the actual tax rates required to achieve this result may be unrealistic. Although both figures are purely illustrative, they highlight the fact that a means tested public pension is likely to lead to levels of net retirement income that will be “stepped” due to the interaction of the means testing and income taxation, rather than smooth. They also suggest that those in similar positions (particularly those adjacent to the various “bounds”) may not receive similar benefits. In short, the concave shape of the net retirement income curve is extremely difficult to implement with a means tested age pension.

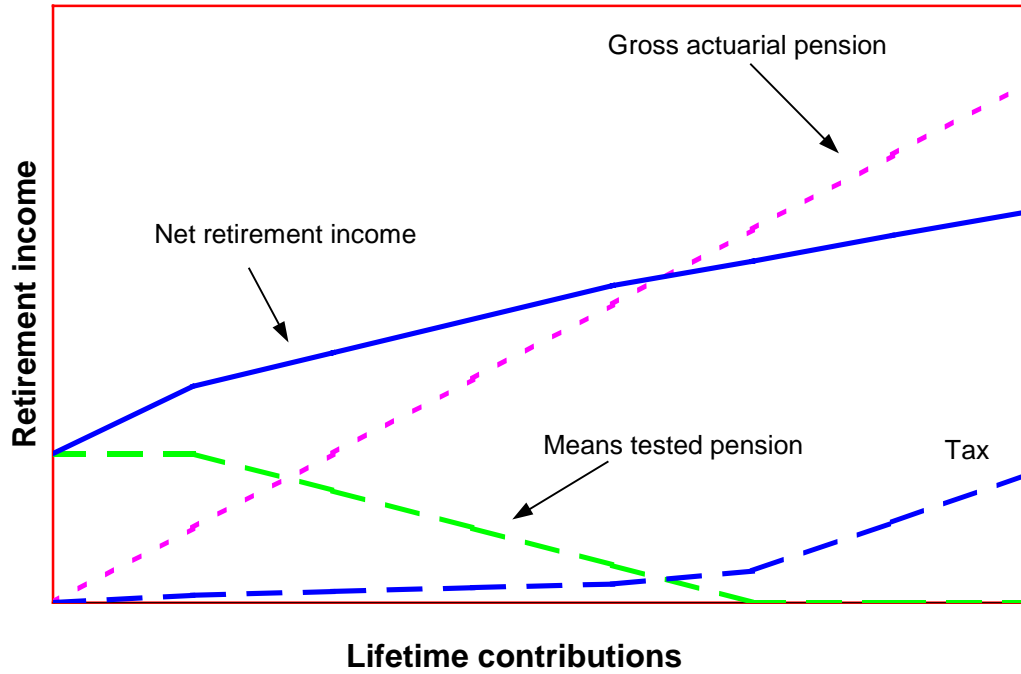
Figure 7 shows the same results as Figure 5, but in terms of the replacement rate. It highlights the fact that the impact of the means test can be to flatten the replacement rate graph, over a significant range of lifetime incomes. Although there is nothing special about the “ideal” shape (which is the same as in Figure 2), it is suggested that a flatter replacement rate curve, as can easily occur with a means test, can reduce incentives to save and have perverse effects in the labour market, both before and after retirement.

Figure 5: A means tested pension and an actuarial pension

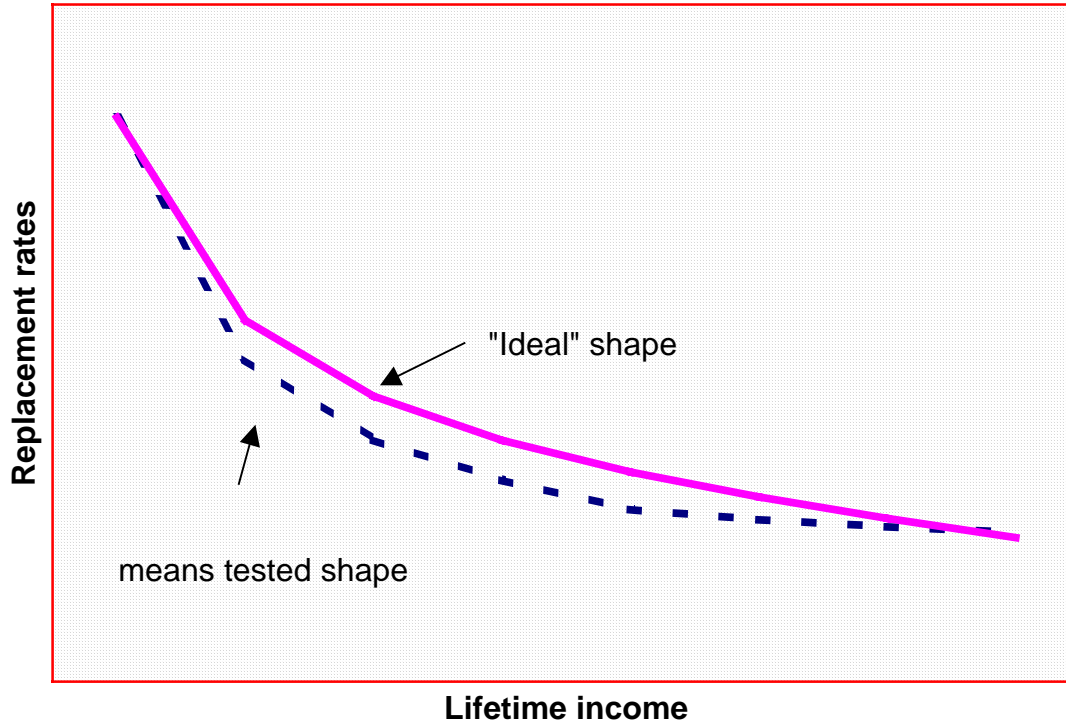




**Figure 6: A means tested pension and actuarial pension with a steeper income tax scale**



**Figure 7: A comparison of 2 systems**



### 3.4 Some additional constraints

The above criteria for the characteristics of an equitable national retirement income system have been established using general principles but with no direct relationship back to the individual economy within which they operate. It is important to recognise that these criteria may therefore need modification to take the actual environment into account. In particular, it is suggested that the following constraints are important:

- The system must be affordable over the longer term. This will have obvious implications for the minimum level of pension as well as any pension formula or taxation policies that are adopted;
- The system should encourage economic growth. It is possible that an equitable retirement income system, in line with these criteria, could be established but that its features could cause considerable economic harm. Examples could include a

disincentive to save for retirement or an incentive to withdraw from the labour market due to a high level of regressivity;

- All retirement income systems involve individuals. It is therefore essential that they engender community confidence and are transparent.

### **3.5 An application: the unique Australian scene**

The existing Australian national retirement income scheme combines a means tested public pension with a compulsory system of occupational superannuation which could be developed to produce an ‘actuarial’ pension. This system satisfies the first two of the equity criteria in that the public pension ensures adequate minimum incomes, whilst the compulsory system ensures that there is a relationship between lifetime contributions and retirement benefits. However, it is questionable if the system is progressive across *all* income levels or if individuals in similar circumstances (in terms of lifetime contributions and/or lifetime incomes) receive similar benefits. In terms of progressivity, it is well known that the effective marginal tax rate for many individuals receiving a part age pension is in excess of 65%, when the income test and income tax rate are combined. These effective marginal tax rates then reduce to below 50% when no age pension is paid such that the net result is similar to that shown in Figure 5. It is therefore suggested that the current Australian system does not meet the criteria suggested in this paper.

## 4 CONCLUSIONS

The objective of this paper was to establish a set of characteristics or benchmarks that is required for a total retirement income system to be considered equitable. It must be stressed that the criteria suggested do not, by themselves, design a national retirement income system. Each society must determine a number of factors including the minimum income level, the relationship between inputs and outputs, the degree of progressivity in the tax system and the determination of “similar circumstances”. There are also a range of issues which have not been discussed in this paper, such as retirement ages, benefit forms, the mix of employer and employee contributions and the roles of the public and private sectors.

Notwithstanding these important and unresolved issues, it is suggested that a national retirement income system can be assessed in terms of its equity through the application of the four criteria outlined above. We contend that ensuring that each of the criteria is met will be a major step forward in the design of an equitable retirement income system for any country.

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