

Age and generations: a general introduction

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This issue of the journal brings together five contributions devoted to comparing standards of living depending on age and generation: methodological contributions relating to equivalence scales and to the econometrics of pseudo-panels; the initial results for France of National Transfer Accounts (NTA) that break down National Accounts aggregates on the basis of age; and comparisons of pension entitlements between public and private sector employees. We return to four of the questions they raise. The first is the issue of separating age, period, and cohort effects: how it is conducted should depend on the question asked. We then advocate a plural approach to intergenerational inequalities, consisting in looking at them from several complementary angles: for example, by referring not only to monetary income, but also to health, and access to education and employment, or housing. We continue by examining the concept of “lifecycle deficit”, which is calculated by the NTA, and is the gap between what a generation consumes and what it produces through its labour throughout its existence. We discuss how it ties in with the broader issue of sustainability, which is the prospective part of the issue of intergenerational fairness. A minimalistic criterion of intergenerational fairness could be that each generation should be watchful to ensure that the next ones enjoy living conditions at least as good as it did. Finally, we comment on the various possible avenues for comparing pension entitlements in the public and private sectors: the difficulty of measuring contribution effort is an argument in favour of an overall approach combining direct salary and all of the pension entitlements.

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Reminder:

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Translated from: « Âges et générations : une introduction générale ».

This issue of *Economie et Statistique* is inaugurating a new version for the journal, which now becomes *Economie et Statistique / Economics and Statistics*, with all of its articles in the electronic edition being systematically bilingual, in French and in English. By keeping the whole of its traditional format in French, the journal wants to continue to enlighten the national economic debate on the basis of work done inside or outside the public statistics system. Simultaneously, publication in English will give that work broader international visibility. The new editing team should be thanked and congratulated for taking the initiative of producing this new version.

As in the past, the research work will be included either in mixed issues or in special theme issues. This issue is part-way between the two types. It is not strictly a special issue systematically covering a single topic. However, the studies it presents have a common denominator that justifies them being grouped together, namely the question of measuring and comparing standards of living depending on age or generation.

Two articles are of the methodological type. The one by **Henri Martin** is devoted to evaluating equivalence scales, a recurrent topic for the journal (Bloch & Glaude, 1983; Glaude & Moutardier, 1991; Hourriez & Olier, 1998) and that is an essential stage in evaluating the standards of living of households whose demographic structure evolves from one phase of the lifecycle to another. It implements one of the possible approaches to the question, namely the approach based on subjective perceptions of standard of living, rather than on indirect indicators such as the shares devoted to food spending or to adult-specific spending, such indicators being more objective but also conventional and probably outdated. The work is interesting because it implements that method on the latest edition of the French Household Expenditure Survey (*enquête Budget de famille*), and because it shows how the results are sensitive to the choice of specification that is made, which would suggest the method needs to be used with precaution: what it gives is a range of possibilities and the work of comparing the standards of living of the households should take that uncertainty into account. The other methodological contribution is the one by **Marine Guillermin**, who offers an instructive presentation of the pseudo-panels method and of some of its recent technical developments, with an application to the relationships between age, generation, and possession of wealth. The article highlights well the relationships between pseudo-panels and true panels, and the way in which the former can constitute interesting alternatives to the latter.

Very much related to that article is the one by **Hyppolite d'Albis** and **Ikpidi Badji** that poses the question of how to separate age effect, generation effect, and period effect for the income and consumption of the households observed from 1979 to 2011. Their work is part of an international project to compile National Transfer Accounts (NTA), that project also being represented in this issue with the article by **d'Hippolyte d'Albis, Carole Bonnet, Julien Navaux, Jacques Pelletan** and **François-Charles Wolff**. The aim of such transfer accounts is to go as far as possible into disaggregating the results of national accounts according to age, on the basis of all of the microeconomic data that so permit (see the website of the National Transfer Accounts Project¹ and United Nations, 2013). We should salute the ambition of this work and emphasise its concern for mapping

1. <http://www.ntaccounts.org/web/nta/show>

as well as possible with the data from the national accounts. National accounts do not have all the answers, but they offer the advantage of providing a consistent accounting framework within which to put the results from sources enabling finer analyses to be made. That is what is done here. Such is also the spirit of Distributional National Accounts (DINA²) that come from the work of Atkinson, Piketty and Saez on high incomes (Atkinson et al., 2011), gradually broadened to all income and wealth distributions. That is also the spirit of the efforts made at the OECD for compiling household accounts that are disaggregated both into age and into socio-professional category (Fesseau & Van de Ven, 2014), using work conducted and continued at Insee since the early 2000s (Accardo et al., 2009). For NTA, the focus is on breaking down by age exclusively, which is a whole subject on its own and manifestly an issue in a context of population ageing and of adapting the transfer systems to accommodate that ageing. The focus on the sole dimension of age is offset by the project offering international comparison and attempting to propose series that are as long as possible.

For its part, the article with which this issue opens, by **Patrick Aubert** and **Corentin Plouhinec**, looks at a highly debated aspect of the fairness of the French intergenerational transfer system, namely comparing pension entitlements in the public and private sectors. It is accompanied by comments by **Antoine Bozio**.

This preface is not going to propose systematic discussion of all of the points covered by the articles. It will limit itself to providing some perspective for four of the questions that they raise. The first perspective concerns the question of implementing pseudo-panel methods and more specifically the issue of identifying the effects of age, of period, and of cohort. The subject might appear technical, but there are important issues at stake when the idea is to decide to what extent successive generations are “privileged”. We would emphasise that it is important not to approach the question from an econometric angle only: it is necessary firstly to think about the exact nature of what we are seeking to measure. The second perspective consists in advocating a plural approach to intergenerational comparisons, consisting in looking at them from several complementary angles. The third perspective consists in linking up the issue of “lifecycle deficit” as calculated by the NTA and the question of sustainability, which is quite simply the prospective part of the issue of intergenerational equality. Finally, we return to the question of intergenerational comparison of pension calculation rules, by continuing Bozio’s discussion about it. How can we compare two pension schemes whose principles are very different, and how can we go beyond the eternal debate about their relative generosity?

Age, period, and cohort effects: how and why should we distinguish between them?

Separating age effect, period effect, and cohort effect is a problem with which we are systematically confronted whenever we have data by age over a long period. This issue is older than the emergence of the term “pseudo-panel”. It is a traditional subject for demographers who, it might be said, did pseudo-panel work for a long time without knowing it. The demographic indices that are in most

2. <http://wid.world/wid-world/>

widespread use are period-based indices constructed by aggregating data that are broken down into age, but it is often the generation effects that we are seeking to read or to anticipate behind the period effects: what will be completed fertility levels for successive generations, and what can period life expectancies tell us about longevity changes according to year of birth? For a long time, the demographic approach to this problem remained descriptive and non-econometric, using graphical representations of the type to be found in the articles by Guillermin and by d'Albis and Badji, graphical representations of the age effects for periods or successive generations that have also been widely used for analysing variables such as employment rates or profiles of salaries according to age.

The article by Guillermin reminds us that the term “pseudo-panel” has another origin. It was in the 1970s that panels of microeconomic data became progressively accessible, those panels monitoring elementary units of observation over time, those units being either households or enterprises. What was and still is expected of such data is that they should help to solve a fundamental problem of econometric inference on cross-sectional data, the estimation biases resulting from the non-observed heterogeneity of the units analysed, when it is correlated with the variables that we are seeking to explain. Having repeated cross-section data makes it possible to neutralise this heterogeneity by consenting to assume it is constant over time. But these “real” or “true” panel data are not always available, and many statistical sources are still in the form of repeated independent cross-sections, without individual monitoring. And, even when the same individuals are monitored from one wave to another, a problem we come up against is attrition, which can be selective and also correlated with the phenomenon of interest. Such attrition often leads to limiting ourselves to short panels, which do not lend themselves well to analysing phenomena whose development all through the lifecycle of the units we want to analyse.

It was in response to these various questions that came the idea of seeing whether grouping together cross-sectional data into homogeneous cells that are monitored over time might be an interesting alternative, preserving most of what is contributed by true panels while also addressing some of their limitations (Deaton, 1985). The term “pseudo-panel” thus includes the old descriptive practice of arranging into cohorts the successive values of data measured according to age, but also augments it with an econometric problem to be solved, namely using that data for explanatory analysis, with the same expectations as what was expected from true panels. This dual aspect (descriptive and econometric) appears clearly in the articles by Guillermin and by d'Albis et Badji, which use both traditional graphical visualisations distinguishing age effects at given periods or for given generations, and econometric modelling of the phenomena of interest, namely wealth in the former case, and income and consumption in the latter.

Regardless of whether the angle of approach is descriptive or econometric, separating the age, period, and cohort effects poses the same problem. In the descriptive approach, its most usual expression is the fact that the apparent effect of age is not the same depending on whether it is looked at from a cross-sectional angle or from a longitudinal angle, those angles neutralising respectively the role of generation, and the role of period. The econometric approach comes up against the same difficulty and reformulates it in terms of identifiability. The three effects of age, period, and cohort of the APC (Age-Period-Cohort) models are linear

and identifiable only up to one linear term because age is equal to the difference between the current date and the year of birth.

With the problem having been reformulated from this econometric angle, we are naturally led to seek econometric answers to it, i.e. the choice of the identifying constraints that make it possible to remove this indeterminacy. The risk to be avoided is the risk of approaching the issue only from the angle of econometric technique, while losing sight of the basic question, namely knowing what exactly we want to measure. The econometric strategy to be implemented depends on what we are seeking to estimate. The study by d'Albis and Badji is a good illustration of this problem. Depending on the case, it is possible to choose deliberately to “load” the generation effect rather than the period effect by purging it of any time trend – this is what the Deaton and Paxson (1994) method does – or *vice versa*.

Knowing which of the two options to choose really does depend on the question asked. An example of when it would seem abnormal to remove any trend from the period effect is the case of contributions to productivity. Admittedly, productivity includes a generational component – the rise in the level of initial training of the successive generations – but for the most part, it is period phenomenon: innovations take place at each period, and, at least up to certain point, they benefit simultaneously and cumulatively all of the generations working at that period. It is difficult to imagine representing that component by a variable devoid of any trend, and which would alternate between periods of growth or, conversely, of recession. In such a case, we need to find other ways of solving the problem of identifiability, e.g. by estimating the generation effect through the observable impact of the level of education of each generation.

Conversely, “loading” the generation effect to a maximum extent is fully justified if the aim is to know how the same progress in productivity benefits the standards of living of the successive generations. Even if the rise in standard of living between generations were due only to period effects, without owing anything to the specific characteristics of the successive generations, it would still remain that the cumulative result of all of these period effects would indeed enable each generation to be richer than the preceding one, and that is the message that we want to emphasise. In which case, this time trend must be found at generation level. This is what d'Albis and Badji do: they use the APC method to highlight that, over all of the cohorts born from 1901 to 1979, no generation has been disadvantaged compared with its elders. More precisely, the standard of living of the baby boomers is higher than that of the generations born pre-war, and lower than that of the generations that come after them.

Loading the generation effect to a maximum extent is also what we would do if we had full longitudinal data that we merely needed to sum over all of the life-cycles, dispensing with the estimation of an APC model: this is how we proceed in the demographic field when we wait for the life cycles to be observed completely before we say what the real developments of the phenomenon of interest over the lifecycles are. This reminds us that the purpose of APC models is not necessarily to identify period effects and generation effects *per se*. They might be seen merely as calculation intermediaries making it possible to give messages about what will become of the generations without waiting for the ends of their lives. But that means going over to a forecasting approach, for which there is no

miracle solution: a forecast requires assumptions. The crucial assumption of the APC approach is that age effects are stable. That assumption is necessary if we want to be able to give messages about the overall lifecycles of generations for which we observe only the ends or the beginnings of their lives, merely on the basis of the very incomplete information we have about them. The assumption of the age effects being stable can only be an approximation. This applies particularly for the effect on income on becoming retired. The improvement in pension entitlements up until the middle of the 1980s rather distorted the age profile of income in favour of retirees, and a reverse movement is expected, ultimately, under the effect of the reforms put in place since the second half of the 1980s, with, in particular, the change to price indexation for the main parameters for calculating pension entitlements. All this would urge us to look behind econometrics. For properly answering the question of the standard-of-living prospects for the younger generations, the APC model is merely an indicative tool that cannot replace more in-depth projection exercises such as the ones regularly conducted for pensions.

Comparing successive generations: we also need to vary the points of view

To continue on this subject, we should point out the limitations – and also the advantages – of another approach to this APC problem, namely the Age-Period-Cohort-Detrended (APCD) models approach that is mentioned briefly at the end of the article by d’Albis and Badji, taken from Chauvel (2013). That decomposition method puts on an equal footing both of the polarised solutions consisting in transferring all of the trend effects either onto the period effect or onto the generation effect, by making both of the two effects stationary. It might be said that the idea is to evaluate the period and generation effects only insofar as they deviate from the general trend. Its limitation can easily be seen: if there is an upward trend in the objective standard of living over time, it seems really difficult to ignore that in comparing successive generations. Nevertheless, this double correction of the trend effect can play an interesting part in attempting to reconcile this message of growth in the standard of living with the perceptions of the relative intergenerational situations. Here, we return to a classic theme of comparisons of well-being or happiness over time, namely the paradox suggested by Easterlin in 1974 whereby an improvement in objective standard of living as measured by the indicators of the national accounts is not found in the evolution of subjective (self-reported) well-being because such well-being is evaluated by the interested parties in terms of difference relative to their aspirations. In such a case, it is the accelerations or slowdowns in growth that translate into variation in perceived well-being. The messages provided by the APC model and by the APCD model are then complementary, one for reporting an objective reality, and the other for reporting the way it is perceived.

Along the same lines, we can point out another way of introducing this concept of relative perception in analysing intergenerational inequalities. For each generation, it is possible, at each age, to look at the way it is situated relative to the other age groups at the same period (Legris & Lollivier, 1996; Blanchet & Monfort, 2002). Let us imagine a general growth trend that is beneficial for everyone but with a specific generation who, at each period, manages to enjoy a relatively bigger slice of the instantaneous cake at each age: for example, if it

has enjoyed a generous family policy when it was young, if it has not had to bear upward transfers that are too high while it was working, and if, on retirement, it benefits from transfers that have not yet been reduced too much. It might well be that this generation will not ultimately have a standard of living that is higher than the standards of living of the succeeding generations. However, the fact that it has given the impression of doing better at each period of its existence is a point that deserves to be reported. We can note that a phenomenon of this type may appear from the article by d'Albis et al. concerning salaries by age. The employee earnings increase from one period and from one generation to the next. But it can also be observed that the generation of 1954, aged 35 in 1979, was already at the mode of the distribution of salaries by age in 1979, and was at that mode again 10 years and then 21 years later, in 1989 and in 2000, a little as if, at each date, it had managed to access the highest paid jobs of the time. This type of phenomenon is doubtless worth looking at a little closer, and, at the very least, it shows the utility of varying the points of view.

Varying the points of view can also consist in multiplying the number of dimensions of well-being or happiness that are used to make comparisons between generations. It is possible, in particular, to refer to Clerc et al. (2011) who use the dimensions of monetary income, health, and access to education, to employment and to housing. By trying to disaggregate the aggregates of national accounts on the basis of age, it can be said that the NTA, like Distributional Accounts, or accounts by social category meet one of the recommendations that had been made by the Stiglitz-Sen-Fitoussi report for going beyond the limitations of national accounts: the recommendation to go beyond the average (Stiglitz et al., 2009). For the NTA, this expression should be understood as “going beyond the instantaneous averages”, which, *de facto*, are not necessarily representative of the experiences of all of the generations concerned throughout their lifecycles. But another aspect of its recommendations is ignored, the one for also going beyond an “all-monetary” logic. A possible explanation for the difference between the message of d'Albis and Badji and the perceived intergenerational inequality might, for example, lie in individuals weighting the consequences of difficulties of access to employment more heavily than as mere monetary consequences, which seems to be a classic result in the literature on determinants of subjective well-being.

Lifecycle deficit and sustainability: how are they related?

The article by d'Albis et al. can also be looked at from another aspect of the Stiglitz message, the one concerning measuring sustainability. This issue of intergenerational equality and the issue of sustainability are really very closely related. Actually, it is quite difficult to agree on exactly what the concept of intergenerational equality covers, but when we ask ourselves the question from a prospective angle, i.e. equality with respect to future generations, there is quite a simple minimalistic criterion that consists in saying that every generation should be watchful to give the next generations the assurance of living conditions that are at least equal to those that it was able to enjoy. It is from this perspective that we can question the concept of “lifecycle deficit”, which is one of the main indicators of the NTA and that gives the article its title. The idea is to compute the difference or gap between what one generation consumes and what it produces through its labour throughout its existence. In the first phases of its existence, each generation consumes only, and then it becomes productive, and its

production outstrips its consumption during its working adulthood, at the end of which its production returns to zero and it becomes a pure consumer again. Naturally, this observation is clearly nothing new, and the contribution that the article makes is rather to quantify this phenomenon, and above all to examine how it evolves over time, be it under the effect of behavioural changes or indeed, at aggregate level, because of the variation in the relative weights of the age brackets that is induced by population ageing. The question is whether or not generations tend to consume an increasingly large fraction of what they produce through their labour, thereby reducing accordingly what they pass on to the next generations. Can this go as far as to a situation of overconsumption in which generations consume more than they produce over their lifecycle?

This aspect of the NTA Project descends directly from an earlier initiative recalled by the authors, namely the attempts made by Kotlikoff et al. to compile accounts by generation. However, there are two important differences. The first is that that approach focused on the issue of fiscal transfers, i.e. on comparing what each generation contributed to and cost the public finances, with the idea of being able to say “who pays for whom” in the game of intergenerational redistribution. The second is the rather militant nature of the approach: speaking out against undue reception of public resources by certain generations, namely those who benefited from the expansion of the Welfare State while leaving some of its financial burden to the next generations (Kotlikoff, 1992). As d’Albis et al. recall, fifteen years ago the journal *Économie et Prévision* had devoted a special issue to discussing that approach (Malgrange & Masson, 2002). The NTA, for their part, take into account the sum of what the generations produce, earn in labour income, and consume – generations can leave, at the same time, both a large public debt and also considerable private assets, it is the result of the two that is important. The NTA also do that in a more detached spirit. The message of the article is intended to be moderate, even though the message is that the deficit has grown. In particular, the gap widened from 1979 to 1989. Expressed in consumption points, we went from a surplus of 6.2% in 1979 to a deficit of 15.3% in 1989, and that deficit has remained roughly stable since then.

Even though it is superior to accounting that is limited to public transfers, the messages drawn from the indicator can nevertheless call for some precaution, but that can be in two opposite directions. In the indicator, there are some details that lead to the problem of sustainability being overestimated and others that tend to lead it to be underestimated.

On the overestimation side: as it is defined, the “lifecycle deficit” compares consumption and production, which is quantified by the inflows of labour income throughout the whole career path. We might be tempted to understand that one generation penalises the next ones whenever it consumes more than it has produced directly through its labour. That would be to forget the part played by capital income.

Firstly, under steady-state conditions, we can have situations that are entirely sustainable and in which each generation consumes more than the income from its labour because it is also possible for a fraction of the capital income to be consumed too without calling sustainability into question. This applies whenever the trend is for the rate of return on the capital to be greater than the rate of growth of the economy – the famous relationship “ $r > g$ ” put forward in the work by Piketty

(2013). That inequality enables each generation to consume all of the income from its labour, and a fraction of the income from the capital, and nevertheless to allow the stock of capital to grow at a rate greater than or equal to g , which is a condition sufficient for that growth to be sustainable.

Secondly, outside steady-state conditions, labour income does not represent a stable fraction of the sum of what the working population produces: the sharing of the value added is deformed and that can distort the message of a comparison between consumption and salaries alone. Perhaps that plays a part in explaining what we observe between 1979 and 1989. The starting point of 1979 is a situation in which, following the first oil crisis, the sharing of the value added was deformed considerably in favour of the salaries, in a way that the policies of the 1980s successfully sought to reabsorb. The initial surplus might be due to this atypical sharing of the value added, and its subsequent resorption would thus have been due to a phenomenon of returning to normal.

It is thus worthwhile to look at the other terms of the accounting equations presented in the article. But fully exploring this idea of taking capital into account could also lead to messages that are less optimistic about the issue of sustainability. If we follow what the Stiglitz report says about it, the concept of the capital that each generation passes on to the next ones should be broadened to include many other dimensions in addition to those that are monitored by national accounts (Blanchet et al., 2009; Antonin et al., 2011). Two main candidates for such broadening of the concept of capital are intangible capital and environmental capital. The message about sustainability can find itself reversed again: a generation might have consumed more than the sum of the salaries over the lifecycle – negative message – but less than the sum of what it has produced overall during its lifecycle, once the earnings from productive capital have been included – hence a positive message – and at the same time leave to the next generations a smaller amount of capital than it had inherited, if the stock of productive capital in the usual sense of the term being maintained or increased is more than counterbalanced by what is taken from the natural assets.

Naturally, in the current state of progress of the NTA, we cannot complain that this broadened vision of the concept of capital was not approached from the outset. A major step has already been taken by broadening Kotlikoff's initial approach to beyond merely accounting for taxes and transfers. And, since they are mapped on national accounts, the NTA are necessarily limited by them: no accounting for natural assets, and intangible asset accounting that is in its infancy. Similarly, some might see it as restrictive to limit the vision of production to market production only: describing non-working retirees purely as consumers naturally ignores their home production. A section of the NTA project that is not presented in this file also aims to take this home production into account, from a gender accounting perspective (d'Albis et al., 2017). There are thus many avenues open, and we should not hesitate to approach them by going beyond the highly normed framework of the core of the national accounts system.

A final remark can be added to that: the authors emphasises the dynamic nature of their approach, i.e. the fact that they have managed to construct accounts in relatively long series, over 35 years, which, so far, only applies to a minority of countries taking part in the project. That is indeed an advantage, but the observation window nevertheless remains too short to reconstruct genuine generational

histories. This is another point about which the choice of the term “lifecycle deficit” might call for a caveat, as the authors also admit. These lifecycles are only pseudo-lifecycles here. To return to using demographer’s vocabulary, the deficits we compute are transversal, i.e. those that a fictitious generation would have, knowing throughout its life the consumption and production conditions by age of the current period. To put things another way, it can be said that the usual concept of aggregate savings rate is also a cross-sectional concept that we might want to transform into a longitudinal one: when the instantaneous rate of savings falls, the behaviour of exactly which generation(s) is the cause of that fall? Answering this question would be advantageous, but, once again, it has a largely prospective dimension and we would certainly not recommend trying to use the same type of APC approach as in the article by d’Albis et Badji: we really find it difficult to see how gaps between consumption and production that are observed either at the very beginning or at the very end of the lifecycle could be used as a basis for econometrically estimating differences in overall deficits over the lifecycles of the generations in question. The only solution is to push backcasting further for the earlier generations, and push forecasting also further for the more recent ones. Indeed, that is what Kotlikoff-style generational accounts were led to do. The NTA should be seen as providing only a fraction of what is required for full generational balance sheets, namely the fraction that covers observing the past, to be supplemented by projection exercises of the same type as those that are constructed for studying pensions. This offers us an opportunity to link up with the first of the articles in this issue, the one by Aubert and Plouhinec.

Comparing pension entitlements: what indicators should be preferred?

An important dimension of these intergenerational transfers are the ones related to pensions spending, about which the journal has already written abundantly, including very recently from this intergenerational comparison angle (Dubois & Marino, 2015). Here, the issue raised is more intragenerational, namely comparing the “generosities” of pension entitlements between the public and private sectors, an eminently divisive subject in the French public debate. Naturally, we cannot make do with naïve comparisons, such as merely putting the average levels of pension of civil servants and private-sector employees side-by-side, as we still often see done. There is no sense in making this type of comparison because the populations have very different average levels of qualification. There would be sense in making this comparison only if France had chosen a Beveridge-type pension system aiming to allocate the same levels of pension to all retirees, regardless of their qualifications and regardless of their past jobs and salaries. This principle is not the one on which the French pensions system was built, in which pension and past salaries are closely linked. The comparison should be made at identical salary levels, which is done here by simulating application of the rules of one or the other of the systems to standard cases whose career profiles have been set. This way of doing things does not completely exhaust the debate, as shown by the discussion by Bozio, but it does show that it is not possible to have a simple and unequivocal position on comparing the two types of rules: one or other of the two systems is the more favourable depending on the standard cases examined.

However, the comparison remains limited to one indicator, namely the replacement rate. Here too, the question arises of diversifying the points of view, and

also of the possibility combining these points of view by using a single synthetic index. A first dimension that is lacking from the analysis is the time for which the pension is paid, and that depends both on the age at which the pension starts being drawn and also on life expectancy. Taking it into account would not pose any particular technical problem, and it is possible to consider combining level of pension and length of payment in the form of an aggregate indicator of present or discounted pension entitlements, which is what the literature often refers to as a wealth equivalent of pension entitlements. But that is still not enough: higher or lower overall entitlements depending on employment categories or grades are not necessarily synonymous with inequality if they are in exchange for past contribution efforts that are more or less large. That is what indicators of return of the pensions system or of return on contributions sought to verify.

The latter type of indicator calls for a few comments to be made. It is quite often excluded from the French debate on pensions due to it having a connotation that is overly “funded pensions” and because of the argument that, in any case, equalising these rates of return on contributions cannot constitute a target for equality, either intragenerationally or intergenerationally.

These two arguments can be refuted. As regards the former, admittedly it is true that calculating return indicators can lead to messages that are apparently unfavourable to “pay-as-you-go” pension financing. Under steady-state conditions, the average return that pay-as-you-go can guarantee to the beneficiaries insured under the scheme is equal to the rate of growth g of the economy, whereas the average return of funded-schemes is, in principle the interest rate r . Funded schemes therefore appear to offer higher performance than pay-as-you-go ones whenever the above mentioned condition “ $r > g$ ” is satisfied. But we do not necessarily need to banish such a comparison, because it does not necessarily convey the message that going over to funded schemes would be beneficial for all. Firstly, there is the fact that such a transition would penalise the transition generations because it is not possible to go back from pay-as-you-go to funded without having to bear a period of double contribution, or without giving up at least some of the entitlements acquired by the generations who have already reached retirement. Secondly, even under steady-state conditions, the relationship $r > g$ may be valid only as a trend. The advantage of funded schemes then comes at the price of the pensions paid being more sensitive to economic uncertainties, and the crisis of 2008 with the sudden devaluation of assets is there to remind us of that. Finally, regardless of whether or not g is close to r , the mere fact that it remains positive provides an argument that is useful in defence of pay-as-you-go: it makes it possible to invalidate the widespread theory that it is synonymous with the young generations contributing “at a loss”, that line of speech doubtless also weighing heavily on the “perceived” intergenerational inequality that we mentioned above.

As for the idea that equalisation of rates of return is not a standard for equality or fairness, that idea is naturally quite true. Social justice entirely legitimises having rates of return that are higher for the least privileged categories – it is the very principle of redistribution – or indeed for categories exposed to particular constraints. But that in no way precludes looking at those rates of return, quite the opposite in fact. Far from opposing redistributive logic, calculating the rate of return on contributions can constitute one of the means of managing such redistribution, by making it possible to check that it is acting in the right direction, with a rate-of-return gradient sloping the other way to the primary resources gradient.

Ideally, it is this approach that we would like to be able to apply to public-private comparison. But, here we come up against an apparently insurmountable difficulty, namely how to measure the contribution effort objectively. Even in the private sector, it is not patently clear how to measure it. The usual approach is to identify it by the rate of contribution, and more exactly by the overall rate of contribution combining the employee and the employer contributions. What needs to be identified is the share of the direct salary that the employees deprive themselves of to fund their future pension. The assumption made is that the overall cost of labour is set exogenously independently of the legally required sharing between employer and employee contributions. This is particularly true if the overall cost of labour is imposed on the economy by the state of international competition. If employees want to keep their jobs at a given overall labour cost, they are obliged to accept that the sum of the two contributions is deducted from their net salary, and it is thus them who ultimately fund their pension entitlements. But the assumption cannot be totally true. And this calculation ignores the fact that, in the private sector, a large fraction of the pension entitlements is funded by non-contributory levies, to which this reasoning does not apply: in 2013, the employer and employee contributions covered only 72% of the total spending for the pension schemes (*Conseil d'orientation des retraites*, 2015).

The problems are even more difficult to overcome in the public sector. We have an apparent rate of contribution for the employee only, the public employer contribution taking the form of a balancing subsidy. Can we consider that that subsidy is ultimately also paid by the employee, i.e. the idea that, if the French State did not have to pay the pensions of its former civil servants, it would give back to its employees all of the resulting savings made? Perhaps that would be true in a world of permeability and of total competition between the labour markets of the public-sector employees and of the private-sector employees, but the assumption is a strong one, of course.

This makes it particularly interesting to look at an alternative avenue mentioned in Antoine Bozio's discussion and making it possible to bypass the issue of contribution effort, at the price of broadening out to an overall comparison including both salaries and pensions. The approach would be to consider that, in an employee's instantaneous pay, there are two components, namely a direct net salary, immediately pocketed, and a deferred salary, constituted by pension entitlements. What can then be aimed for is an overall comparison of the sums of direct net salaries and deferred ones, both discounted all over the lifecycle. As a result, we broaden the issue to include more than the pension entitlements, but is that not the real problem on which we should focus in making such comparisons between the public and the private sector? If replacement rates that are higher for certain categories or grades in the civil service are accepted in compensation for a lower direct net salary and/or for specific constraints, this type of indicator will give us the correct message regarding equality between the two categories of population in terms of present overall entitlements as discounted over the lifecycle. There would be inequality only if one or the other of the categories totalled direct salary and deferred salary that were both higher, for identical qualifications and job characteristics. Here, there is an area to be explored that brings together analysis of pensions and analysis of wage inequalities.

That said, another way out of the suspicion of unequal treatment between the two categories of the population would be to work more to have the rules of

the two types of schemes converge. The bottom line is that, if the rules and the modes of funding were totally identical, the issue of comparing the two pensions systems would become a non-subject, and comparing the two categories could boil down to comparing salaries alone, leaving the salary alone to compensate for the specific constraints of the various jobs. But that is another story, and would doubtless take a very long time to achieve. □

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