



Working Paper Series
Department of Economics
University of Verona

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Paolo Pertile, Veronica Polin, Pietro Rizza, Marzia Romanelli

WP Number: 4

January 2012

ISSN: 2036-2919 (paper), 2036-4679 (online)

Public finance consolidation and fairness across living generations: the case of Italy*

P. Pertile[†] V. Polin[‡] P. Rizza[§] M. Romanelli[¶]

Abstract

The paper is a contribution to the study of the redistributive impact of public sector intervention across living generations. We aim to work on a comprehensive approach, so that reforms involving several taxation and spending programmes, possibly implemented over several years, may be assessed. By adapting methods from the generational accounting literature, we investigate the impact on fairness between living generations of fiscal policies undertaken in Italy between 1990 and 2008. Large intergenerational differences exist in net tax rates calculated over the residual lifetime horizon, which tend to be substantially higher for young generations. Pension reforms introduced in the '90s play a major role in explaining these differences. We conclude that a significant contribution to the sustainability of these reforms might have come at the price of an unequal distribution of sacrifices across living generations. Awareness of these differences could help in designing additional consolidation efforts in the perspective of achieving intergenerational fairness in Italy.

1 Introduction

An analysis of redistributive impacts is central in the assessment of fiscal policies. However, the scope of analyses typically carried out is often limited to short-run effects of specific taxation and spending programmes. Natural extensions include, among others, the separation of lifetime intrapersonal redistribution from purely interpersonal redistribution. The latter dimension can in turn be investigated from a number of perspectives, depending on the characteristics according to which individuals are classified. For instance, Bjorklund and Palme (1997) isolate the redistributive effect of income taxation on permanent income. One alternative to the comparison of individuals with different incomes is the

*The present work is a development of some ideas previously included in a contribution by the same authors to Schizzerotto A., Trivellato U., Sartor N. 2011 (eds.) "Generazioni Diseguali"; Collana della Fondazione Ermanno Gorrieri per gli studi sociali. Il Mulino, Bologna.

[†]Department of Economics, University of Verona.

[‡]Department of Economics, University of Verona.

[§]Bank of Italy.

[¶]Bank of Italy.

comparison among different generations.

Impacts of policy reforms on intergenerational fairness may be direct or indirect. In the first case, reforms are designed so that different rules apply to different generations. In the second, they indirectly produce asymmetric effects across cohorts, because they involve cuts (expansions) in programmes which can be more or less relevant for individuals depending on their position in the life-cycle. Some studies investigate the intergenerational fairness implications of reforms involving specific taxation and spending programmes¹. This kind of analysis may not be always fully satisfactory, as several spending programmes are financed not through specific taxes, but through general taxation. Furthermore, single reforms may be designed within broader processes of public finance consolidation - a situation now being faced in several countries coping with the impact of the global crisis on public debts.

A study of intergenerational redistribution may adopt two different, yet complementary, approaches. Retrospectively, the *status quo* in terms of intergenerational fairness, or the impact of past reforms on the *status quo* can be investigated. Prospectively, estimates of the impact of diverse reforms can be made. The two approaches are complementary, as knowledge of the *status quo* is essential if future policies are to ensure intergenerational fairness.

In this framework Italy is a particularly interesting case-study, having undergone a significant consolidation process in the '90s and now having to face further consolidation, because of the current financial crisis. At the beginning of the Nineties, Italian public finances were largely unbalanced. Deficit-spending policies since the mid-Sixties had led to a double digit deficit-to-GDP ratio; public debt had overtaken GDP and was on an upward trend; the generous pay-as-you-go social security and welfare systems were unsustainable (Franco et al., 1993). This changed dramatically in the '90s: the financial crisis of 1992 and the run-up to the European monetary union (EMU) had called for significant fiscal consolidation. This was effective in achieving at least moderately improved fiscal sustainability and admittance to the EMU. The impact of the consolidation process on fiscal sustainability and the burden left to future generations have been analysed in a number of papers (see Cardarelli and Sartor (2000), and Rizza and Tommasino (forthcoming)). However, the allocative and redistributive implications of the consolidation policies introduced in the '90s are less clear and have received less attention in the literature (Balassone et al., 2003). In particular, in our view, the distribution of the burden across living generations has not been sufficiently investigated.

When fiscal policies involving several public programmes are the object of study, the corresponding analysis of intergenerational fairness needs to be not only precise but also as comprehensive as possible. Some studies have estimated the present value of net transfers related to a specific subset of public programmes for a large number of cohorts (Bommier et al., 2010). However, the ideal candidate to define the life-cycle position of an individual with respect to the public sector is net payment as calculated in generational accounting exercises, where

¹Examples include Cutler and Sheiner (2000) and Boldrin and Montes (2005).

the entire public budget is usually allocated. Generational accounting (GA) in its standard application is mainly aimed at the assessment of fiscal sustainability. However, an indicator of intergenerational unfairness is also present as the difference between the net payment on current newborns and those on future generations. It is assumed that the burden of corrections needed to close the fiscal gap which is still to be legislated is entirely borne by the latter. Such a forward looking perspective, however, provides only a partial measure of unfairness, insensitive to the relative position of all living cohorts other than new-borns. Indeed, a fiscal consolidation process could ensure both long-term sustainability and equal treatment between new-borns and future generations, while fully exempting all other generations.

Standard generational accounting methods can be extended to obtain valuable information on intergenerational differences among currently living and past generations. A study of intergenerational fairness based on generational accounting was undertaken in Auerbach et al. (1993) for the United States. Wolfson et al. (1998) did a similar exercise for Canada, taking a smaller number of programmes into account, whilst allowing for heterogeneity among individuals in some other dimension in addition to age and sex. We are not aware of similar studies performed in Europe. The perspective adopted in these studies is historical, with lifetime indicators calculated for cohorts born as early as 1900 in Auerbach et al. and 1890 in Wolfson et al. (1998). Unless very good historical data are available, estimates over the entire life-cycle for generations born so far in the past are hindered by imprecision, in that assumptions must be introduced to compensate for the lower reliability of old data. On the other hand, obtaining estimates for such a large number of cohorts becomes less crucial when the objective is to assess recent reforms or provide information to design future ones in the perspective of intergenerational fairness, given that younger cohorts, for which good data are more likely to be available, are also those with longer residual lifetime horizons.

In this work we do not adopt a historical perspective, rather, we focus on the policy implications of intergenerational unfairness *vis-à-vis* the public sector, and hence on the relative position of currently living generations. The aim of the present paper is to assess how living generations differ in terms of their lifetime net position (present value of the difference between taxes paid and transfers, both cash and in-kind, received) with respect to the public sector, and to what extent they have contributed to the consolidation process now underway in Italy since the beginning of the '90s. 2008 is the most recent year for which all relevant data are available. Efforts recently undertaken or under evaluation to cope with the ongoing financial crisis, therefore, are not part of the consolidation process we assessed. Interestingly, however, some of these efforts are consistent with the policy implications that can be drawn from our exercise. Our assessment of intergenerational equity is comprehensive in that the entire budget is allocated, and in that we captured the effects of the policies undertaken over the whole time period (19 years) under examination. Moreover, the fact that for a number of years the analysis is based on actual data rather than on projections, allows us to reduce the sensitivity of the results to changes in

the adopted set of parameter values. This is often pointed out as a serious limitation of the GA approach².

The main finding of the paper is the sharp increase in the residual lifetime net tax rate faced by comparatively young generations arising from the design of the pension reforms carried out in the '90s. This finding is confirmed by the exercise aimed at disentangling the role of such reforms in determining intergenerational differences in the net tax rate. Other reforms, such as an increase in personal income taxation, made substantial contributions to consolidation, but were roughly neutral with respect to intergenerational redistribution. Section 2 of this paper presents the methods employed in the context of the existing literature. Section 3 compares net tax rates over the residual lifetime horizon for different living generations. Section 4 highlights the role of fiscal policies undertaken since the '90s in determining intergenerational differences discussed in the previous section. In Section 5 we present our conclusions.

2 Background and methods

In the GA literature the concepts of sustainability and intergenerational equity are closely related. In the steady state only one level of a generation's net lifetime payment exists such that larger or smaller net payments need not be imposed to future generations to satisfy the intertemporal budget constraint (Kotlikoff, 1999).

Generational accounts, i.e. the present value of net payments to the public sector over the lifecycle, are essentially obtained through a two-step procedure. First, the present value of the net payment is calculated for cohorts born before the base year according to current fiscal rules, assuming that the growth rate of the age-adjusted per-capita value of taxes/transfers is consistent with total productivity growth³. This generates future deficits or surpluses that in the second step are included in the intertemporal budget constraint to determine the fiscal burden on future generations (those not yet born in the base year) as a residual. The difference between the tax burden of representative individuals belonging to the cohort of newborns and of those not yet born quantifies the additional fiscal burden imposed on each future cohort so as to make fiscal policy sustainable⁴. The present value of net payments for currently living generations is also part of the results but it is of little interest as long as the objective is assessing sustainability of current fiscal policies. In terms of equity, the differences in the generational accounts of individuals of different ages can hardly be used to draw conclusions regarding the intergenerational (un)fairness of budgetary

²For a discussion about the limitations of the GA methodology see Haveman (1994); Diamond (1996); Buitier (1997).

³Alternatively, age-adjusted per-capita amounts may be made to grow at a pace consistent with available projections of the budgetary item, apportioned according to the age-profile.

⁴Moreover, the additional burden is usually assumed to be borne by future generations only. The assumption that future generations bear any further required burden is justified to convey the message of how much generational discrimination we introduce if we do not act immediately.

policies because even if they ensured perfect intergenerational equity, the net lifetime payment over the remaining years of life would still differ. For example, the present value of the net tax over the residual lifetime horizon is typically positive for an individual who enters the workforce, earns labour income and pays taxes on it for a considerable number of years before retiring, while it tends to become negative as retirement age approaches.

In order to expand the range of possible intergenerational comparisons, the problem of age homogeneity can be addressed mainly in two ways:

- A. calculating the lifetime net payment for current living generations by reconstructing data for a number of years preceding the base year;
- B. investigating policy changes rather than current fiscal policies to compare impacts across generations living in the base year;

Auerbach et al. (1993) employ approach A and provide intergenerational comparisons based on the entire lifetime horizon. Approach B is used in Fehr and Kotlikoff (1999) to simulate the impact of hypothetical policy reforms on living generations aged between 21 and 75 in the base year. The rationale for this method is that the age effect is clearly less important when comparisons among levels are replaced with those among variations.

Both approaches can yield potentially useful insights but have limitations. The further back in time the more likely that assumptions must be introduced to compensate for the lack of reliable data. For A, this implies a trade-off between the number of generations that can be compared (which is larger the larger the number of past years for which data are recovered) and the reliability of the results. For B, it is questionable whether changes in the net payment for generations with different residual time horizons are immediately comparable or not. For example, young generations are arguably better equipped to face a large increase in net tax, given their opportunity to smooth effects over a longer residual lifetime horizon by adjusting consumption-saving profiles.

Sections 3 and 4 use the concepts underlying A and B respectively to evaluate the intergenerational distribution implications of budget policies undertaken in Italy from 1990 to 2008. We do so by adjusting methods proposed in Auerbach et al. (1993) and Fehr and Kotlikoff (1999) with the objective of assessing the intergenerational fairness implications of policies adopted over a specific period of time, whilst reducing our reliance on assumptions to a minimum.

In particular, we exploit the fact that past data can be used to obtain precise estimates of average taxes and transfers by year and age for a number of years (19 in our case, from 1990 to 2008). In Section 3, this information is used to estimate a residual lifetime net tax rate (henceforth, RLNTR) for several cohorts using 1990 and 2008 as base years. This allows for age-homogeneous comparisons between pairs of generations of the same age in the two base years. We will argue that disregarding part of the life-cycle in this study does not preclude drawing some relevant conclusions. If this be the case, our approach can prove useful whenever the quality of past data is insufficient for a reliable reconstruction of the net fiscal position of individuals over their whole life-cycles.

This analysis, which provides a picture of the *status quo* in terms of fairness between living generations, is then correlated with an exercise based on approach B, aimed at highlighting the role of the consolidation process undertaken mainly in the '90s in determining different positions across generations. This requires the designing of a hypothetical scenario describing the most likely evolution consistent with the pre-1990 fiscal regime. An analysis of the differences across the different generations in the two scenarios provides insights into the inter-generational redistribution impact of the consolidation process.

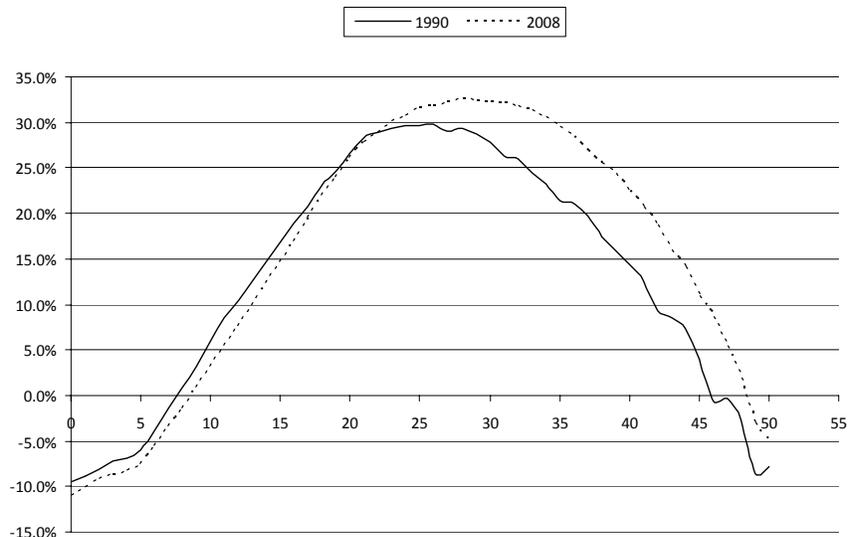
3 Intergenerational differences in the residual lifetime net tax rate

The analysis carried out in this section uses official budget data (ISTAT, 2010a,b; MEF, several years) for the years 1990-2008 as input, apportioned to representative individuals by age according to age profiles. The latter have been, in turn, estimated (year-by-year from 1990 until 2008) through survey and administrative data. Homogeneity in the comparison is ensured by comparing pairs of cohorts with the same position in the life-cycle in different years, i.e. of the same age in different years. In principle, we could compare any pair of cohorts whose age difference is equal to x ($x < 18$) by estimating generational accounts over residual lifetime horizon for that age in two base years such that the length of the period in between is x years. Our analysis focuses on intergenerational differences in the ratio between generational accounts over the residual lifetime horizon and the present value of incomes over the same period, which yields a measure of the lifetime net tax rate (Auerbach et al., 1993). In order to ensure that cohorts subject to comparison are sufficiently differentiated, i.e., they can actually be seen as different generations, we compare cohorts whose age difference is maximum in this range. The results presented in the remaining part of this section are, therefore, obtained computing generational accounts twice, first using 1990 and then 2008 as base years. The latter is a standard forward looking GA computation, which uses 2008 data for the projection of future taxes and transfers for each cohort. The former uses the same approach for years after 2008, whereas in the period 1990-2008 age specific average taxes and transfers are obtained from official budget data and year-specific age profiles based on either administrative or survey data.

The productivity growth rate is a crucial factor in obtaining estimates of future taxes and transfers. In our baseline scenario a 0.5% growth rate is assumed, reflecting the average real growth rate of per-capita income over the period 1990-2008⁵. The same criterion cannot be extended to pensions for two reasons. First, the complexity of the rules of calculation of the individual benefit is such that the link between the dynamics of these transfers and the dynamics of labour income over the same period might be very weak. Moreover, pension re-

⁵Sensitivity analysis was performed using a 1.5% growth rate; no impact on the quality of the results was seen.

Figure 1: Residual Lifetime Net Tax Rate



forms implemented in the '90s have substantially changed these rules, explicitly introducing differences based on the number of years the individual had already been paying social contributions at the time when the reforms were approved. In order to take this complexity into account, prospective average pensions are estimated using the dynamic micro-simulation model Mind⁶ and assuming a 0.5% real growth rate for labour income.

RLNTRs for each age calculated using 1990 (solid line) and 2008 (dashed line) as base year are reported in Figure 1. Because of the aforementioned dependency of the net fiscal position on age, homogeneous comparisons can only be made vertically. Hence, for example, the RLNTR of a representative individual born in 1980 (aged 10 in 1990) can be only compared with the RLNTR of an individual born in 1998 (aged 10 in 2008). The informative content of such comparison tends to fall as age increases, since the portion of the life-cycle dropped from the analysis is greater. Hence, Figure 1 only shows results up to the age of 50.

The most evident finding is the substantial increase in RLNTRs faced by those aged over 25 in 2008 in comparison with individuals who were the same age 18 years earlier. This difference peaks at 8.43% at the age of 43. However, younger cohorts enjoy an advantage at ages approximately below 25. Since the difference appears smaller in this case, we will focus on differences at intermediate ages. Some additional comments on differences at lower ages will be provided at the

⁶The model is described in Vagliasindi et al. (2004).

end of this section.

Reaching immediate conclusions on the relative position of different cohorts in terms of exchanges with the public sector from Figure 1 may not be easy, because most cohorts appear twice in the figure, with their tax rates calculated using 1990 and 2008 as base years. Therefore, in the remaining part of this section we mainly focus on three cohorts whose positions clearly elucidate the findings shown in the figure: cohorts of individuals born in 1952 (hereinafter G_{52}), 1970 (G_{70}), and 1988 (G_{88}). Note that G_{52} is age 38 in 1990, as is G_{70} in 2008. G_{70} is 20 in 1990, as is G_{88} in 2008. Age 20 is chosen, specifically because most exchanges with the public sector have not yet taken place. Extending the analysis to the age of 38 allows us to extend comparisons whilst still taking into account a substantial portion of the life-cycle.

The residual net lifetime tax rate is 17.4% for G_{52} , substantially lower than the 25.6% faced by G_{70} at the same age (38). On the other hand, there is virtually no difference between the position of this generation (calculated at age 20) and that of G_{88} (26.6% vs. 26.2%).

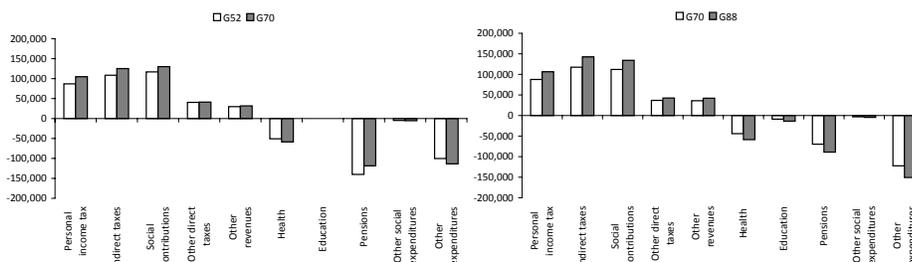
We investigate the determinants of these intergenerational differences, by disentangling differences in all the main tax and transfer programmes. For the main aggregations of tax and transfer programmes⁷, Figure 2 compares the net present value of the tax or transfer for both pairs of generations under examination. In general, the present value of the taxes tends to be larger for the younger generation (G_{70} and G_{88} respectively in the left and right panel) for all the aggregations of taxes considered (personal income tax, indirect taxes, social contributions, other direct taxes). The size of the increase in the tax burden over the life-cycle faced by young generations ranges from a minimum of 1.8% for “other direct taxes” at age 38, to 21.4% of “personal income tax” at 20. A larger present value of taxes for younger generations does not necessarily imply that any additional burden is imposed on those generations. Part of this increase is explained by productivity growth which implies a larger tax base for the young generations, who experience 18 more years of potential growth before they reach the same age as the generation with whom they are compared.

As far as in-kind benefits are concerned, the figure shows that the present value of the monetary value of “health care services” and “education” is larger for younger generations. In the case of health care, this is a result of the increase in the per-capita value of health expenditure in real terms between 1990 and 2008. The average per capita increase in real terms was 1%, very close to the average per-capita GDP real growth (0.9%). This is somewhat in contrast with the general tendency in industrialized countries, where age-adjusted health care expenditure grows more rapidly than GDP⁸. This was the result of a number of policies, including expenditure cuts and the National Health Service re-organization, which made Italy one of the very few OECD countries to reduce health care expenditure over GDP during the '90s.

⁷In the GA estimate procedure, the entries presented in Figure 2 were further disaggregated.

⁸Several mechanisms have been discussed in the literature that could lead to this result. For an overview, see Gerdtham and Jonsson (2000).

Figure 2: Present value of taxes and transfers over residual lifetime horizons (euro 2008)



As to education, since the age of the cohorts that we compare is at least 20, our results loosely reflect changes, if any, concerning university education. Figure 2 shows an increase in the present value of education when cohorts under comparison are 20. These data reflect an increase in participation in university education, rather than higher average per-student expenditure. There is consensus that changes to the pension rules⁹ were the main structural reforms implemented during the period under consideration. Whether this was sufficient to restore equilibrium to the pension system or not is under discussion, but that the reforms aided the sustainability of the system is beyond question (Sartor, 2001; Balassone et al., 2003). In general, Figure 2 shows that, in both comparisons (G_{52} vs G_{70} and G_{70} vs G_{88}), the differences between taxes paid and benefits received by the older generation with respect to the younger are very similar, with the latter paying more taxes and receiving more benefits: a result of the productivity growth occurring between the two base years. There is, however, a relevant exception: in the first of the two comparisons (G_{52} vs G_{70}), pension benefits are larger for the older generation, such that they more than offset the effect of the productivity growth. The advantage enjoyed by the older generation is sizable, with G_{70} receiving only 81% of G_{52} 's pension benefits. This cut in pension benefits underscores the magnitude of the effect of the reform on the young, as does the larger amount of social contributions, through which pensions are funded, that the young pay.

The origin of this apparent intergenerational discrimination lies mainly in the increase in the retirement age and in the change in the rules for the computation of pension benefits (Franco, 2002). The rule change is more relevant, especially in terms of intergenerational equity, because different rules applied to senior and junior workers and newcomers were introduced. The implications for the former were comparatively limited, the main change being an increase in the number

⁹The current rules are mainly the result of two reforms carried out in 1992 (“Amato reform”) and 1995 (“Dini reform”). Less substantial changes were also introduced in subsequent years of the period under consideration.

of salaried years taken in for the computation of the pension benefit. Under the pre-reform regime, pension benefits were computed applying a replacement rate to past salaries. With the 1995 reform a new regime was introduced, with benefits computed by applying a replacement rate to contributions paid, negatively related to life expectancy, compounded at the nominal GDP growth rate. Pension benefits are computed according to the new rules for those who entered the labour market starting from 1996, whereas past salaries are still the basis for computation for workers who had been paying social contribution for at least 18 years in 1995. For the remaining workers, pension benefits are computed as weighted average of the application of the two rules, with weights proportional to the length of the working periods before and after the reform. Overall, the new regime is far less generous than the old. Given this set of rules, G_{52} is very likely to escape, at least to a large extent, the shift from salary-based to contribution-based pension benefits. The generation of comparison is 18 years younger. Consider two individuals: one G_{52} the other G_{70} , who start to work at the same age. The elder comes under the old regime having worked 18 years in 1995: pension benefits of the G_{52} individual are salary-based, whereas those of the representative individual for G_{70} are contribution-based. The system is far less generous towards the latter. Observing that according to the rules G_{70} and G_{88} are treated similarly, and that the larger pension benefit G_{88} enjoys basically parallels the larger amount of contributions paid, we can conclude that pension reform has been the main driver of intergenerational inequity introduced by the budgetary policies in force in Italy since the '90s. This discrimination was not a mere side effect of consolidation; it was explicitly written into the rules defining the pension reforms. An obvious caveat of the above analyses is that they ignore exchanges with the public sector occurring respectively up to the age of 37 and 19. Defending age 20 as a starting point is relatively easy, given that taxes and benefits paid and received up to that age are a small proportion of the whole generational account; adopting age 38 as a starting point in the comparison between G_{52} and G_{70} requires further explanation. It could be argued that if G_{52} had received less than G_{70} during the first 37 years of life, the detected discrimination against G_{70} could simply compensate for that. Although this is theoretically possible, it is very unlikely given that a G_{52} individual's first 37 years of life coincide with a rapid expansion of the private economy and the role of the public sector.

One could also object that the impact of non-structural changes that might have occurred between 1990 and 2008 would only affect the generational accounts of the old generation (G_{52} or G_{70} depending on the comparison we are making) even though the young generation (G_{70} and G_{88}) would have also experienced it in the first part of the lifecycle (which is excluded from the analysis). In fact, some temporary measures aimed at fiscal consolidation were introduced during the period in the form of additional one-shot taxation¹⁰. When the generations to be compared are 20 years old respectively in 1990 and 2008, the impact of this

¹⁰Such taxes were levied both to contrast the effects of the financial crisis and to meet the criteria to join the Monetary Union.

omission is very likely to be minor, because the amount of taxes paid up to that age is negligible. This might not hold for the comparison between generations whose age is 38. However, a correction for the fact that the younger generation also contributed to the consolidation would help strengthen the main result of the present analysis: the higher lifetime net tax rate faced by G_{70} in comparison with G_{52} .

The analysis of intergenerational differences for specific tax and spending programmes that has been carried out for three specific cohorts can be used for a more general interpretation of intergenerational differences as shown in Figure 1. The previous analysis showed that most of the increase in the RLNTR experienced by the generation born in 1970 with respect to the one born in 1952 is due to the pension reforms. The comparison between these two generations is particularly instructive because, with some approximation, the older cohort is subject to the pre-reform rules, whereas the younger one is subject to the new ones. This can also explain why differences tend to disappear when the 1970 generation is compared with that of 1988. The design of the pension reforms suggests some form of monotonicity for cohorts born between 1952 and 1970, given that most of their pension benefits are likely to be calculated according to both the old and the new rules, with the weight of the former increasing with the number of years worked before 1995. This interpretation is consistent with the shape of Figure 1, where the intergenerational gap is virtually absent around the age of 20 and progressively widens until the age of 43, after which it tends to fall again. In other words, intergenerational differences tend to be small when generations under comparison face the same pension rules - a generous salary-based system for older generations and a far less generous contribution-based one for younger generations - while differences are substantial for generations who face different rules as a result of the transition from the old to the new regime.

Finally, Figure 1 shows that the sign of the intergenerational gap is reversed for ages lower than 20, although the size of this gap is much smaller in absolute value than the one observed above that age. These differences are more difficult to interpret than those mentioned above. One reason for this is that young individuals will be involved only in specific public programmes (mainly education and health) for a number of years. Therefore, due to discounting, the weight of these programmes in determining the RLNTR for these cohorts is particularly large when compared with the weight that they have within the public budget. For the sake of simplicity, if we restrict our attention to newborns so that the analysis covers the whole life-cycle, the difference between the RLNTR faced by the cohort born in 2008 is 1.47 percentage points lower than that of individuals born in 1990. Apportioning this difference into changes in specific programmes, the two generations face loosely the same tax burden over lifetime income, whereas spending programmes slightly favour the younger. In particular, there are differences in “health”, “education” and the residual aggregate “other expenditures”. While a small increase in “other expenditures” is difficult to interpret because of the residual nature of that aggregate, health and education expenditures can be discussed. Two factors may contribute to explain

the difference in health expenditure. First, the contraction in the ratio between health care expenditure and GDP in the '90s was only experienced by those born in 1990, as expenditure grew more rapidly in the following decade. A further determinant may be the difference in survival probabilities, which favours younger generations because it implies, *ceteris paribus*, an increase in the expected value of taxes paid and transfers received. Since most important transfers related to health care occur towards the end of life, when survival probabilities matter, this leads to a larger expected transfer for the younger generation. Likewise, a higher probability to receive the transfer also explains the difference in size of the education transfer, wherein the change is related to the fact that rates of participation in education were increasing in the period between the two base years.

4 The impact of consolidation

The previous section looked at intergenerational unfairness toward comparatively young generations. That the generations with a higher RLNTR are also those subject to all of the effects of the pension reforms suggests that these reforms play a major role in explaining the discrimination. However, to properly disentangle the impact of all of the fiscal policies undertaken since the '90s, the scenario drawn from actual data must be tested against a counterfactual scenario, which wipes out all the policy changes enacted between 1990 and 2008. In this section we compare the residual lifetime net payments for different living generations in 1990 under a “consolidation scenario” (hereinafter, C) with a like amount under a “hypothetical scenario” (H), which reports the consequences of not having initiated a consolidation process. Scenario C is based on actual data, i.e., those used in the exercises carried out in the previous section, with 1990 as base year. The assumptions and aims of scenario H are outlined in the following subsection.

4.1 Hypothetical scenario

Scenario H in our exercise aims at describing the situation that would have been observed if the consolidation process had not been undertaken, i.e., if fiscal policy had been consistent with the pre-1990 regime over the whole time horizon. We aim to reduce to a minimum the inevitable degree of discretion and to obtain estimates as robust as possible regarding the introduction of alternative assumptions.

To this end, scenario H is consistent with a standard GA application that could have been performed in 1990 to assess future sustainability. The only difference is that we exploit knowledge of actual productivity growth for the period 1991-2008, whereas this parameter is estimated in purely prospective GA applications. In particular, the general rule in the definition of Scenario H is that growth rates for tax and expenditure programmes are in line with total productivity growth recorded over that period. This assumption is likely to lead

to a conservative estimate for the size of the impact of the fiscal consolidation process. In fact, public expenditure growth rates in the '70s and '80s were often substantially above productivity growth rates. Replicating this tendency after 1990 would have led to larger virtual deficits than those resulting from our assumptions. Exceptions to this general rule have been introduced for mandatory pensions and health care expenditure. The relationship to productivity growth is far less direct for pensions than for other tax and transfer programmes and it may be substantially affected by the characteristics of the pension scheme. Whatever the rules, however, transfers related to pensions in period t are related to productivity (especially labour productivity and hence wages) not in period t , but in earlier periods. Keeping in mind our objective of obtaining a robust estimate of the impact of the reforms, we ignore this and assume that the growth rate of average pension transfers over the period 1991-2008 is equal to the growth rate actually observed. In other words, we are assuming that pension reforms had no impact on pension expenditure until 2008, which is again leading to a conservative impact of the reform. After 2008, we once again link the growth of average pension benefits to the growth rate of average labour income over a previous period (i.e. 1990-2008) so as to account for the fact that pension incomes are related to the past dynamics of labour income. In particular, we assume that the ratio between the growth rate of pension transfers after 2008 and the average growth rate of labour income over the period 1990-2008 equals the ratio between the average growth rate of pension transfers between 1990 and 2008 and the average growth rate of labour income between 1974 and 1991¹¹.

For health care expenditures, we take into account their tendency to grow more rapidly than GDP in all developed countries. Therefore, the growth rate of the average in-kind transfer per capita is adjusted to the dynamics of GDP, using the relationship between the two variables observed over the period 1981-1991¹² as reference.

4.2 Results

The solid line in Figure 3 shows the difference between the present value of net tax over the residual lifetime horizon of each cohort under Scenarios C and H (positive values imply higher payments).

In assessing fairness one must first define it. One might require that the same burden be imposed over the residual lifetime of all living cohorts, so that the benchmark would be a horizontal line in Figure 3. This is very questionable in that the yearly additional payment to the public sector would have to increase with age. A more sensible approach to intergenerational equity might require

¹¹This leads to a 0.8% growth rate after 2008.

¹²The average growth rate of health care expenditure over this period was 3.5%, while the per-capita GDP average growth rate was 2.4%. Assuming stability of the ratio between these two growth rates implies a 1.4% increase of per-capita health care expenditure over the period 1990-2008 (the actual average per-capita GDP growth rate being 0.9%) and 0.7% increase since 2009 (having assumed equality between the growth rate of per-capita GDP and incomes).

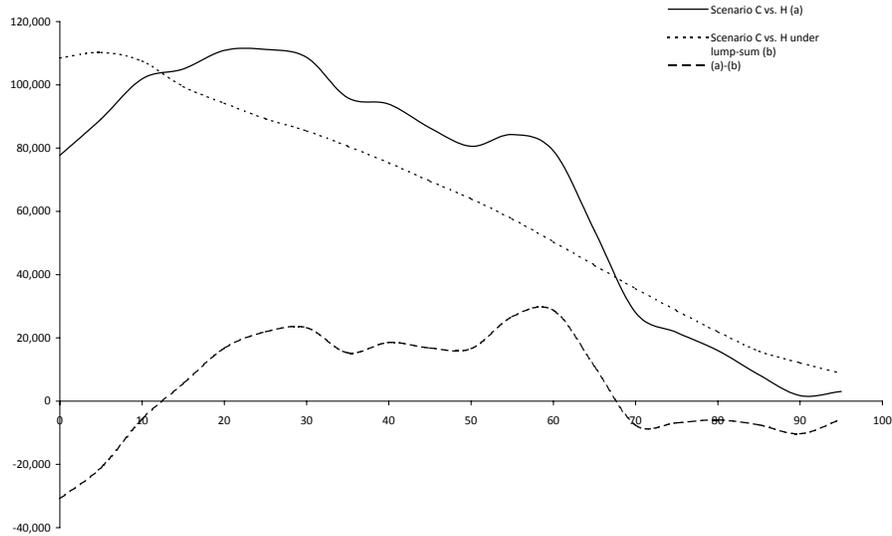
that the same price per year be paid by all living generations. This benchmark is the dotted line in Figure 3, and represents the introduction of a lump-sum tax under scenario H, whose size is such to replicate the consolidation results obtained under scenario C. Specifically, the extent of the consolidation is defined with respect to the difference between the net tax on newborns and future generations¹³. The dashed line in the figure shows the difference between the actual sacrifice under scenario C, and the “lump-sum” burden for each cohort. In analysing the relationship between Figure 3 and the results in Section 3, one must bear in mind an important difference between an approach based on the homogeneity of residual lifetime horizons (Section 3) and the present analysis, where they differ for each cohort. This difference plays a major role when the impacts of a policy are restricted to a portion of the life-cycle. When residual lifetime horizons are of equal length, as in Section 3, the time lag between the base year and the time when the policy produces its effects is equal for all generations under comparison. Since this is no longer true when the approach is the one adopted in this section, the discounting mechanism implies increasing weights for the same event as the distance in time between the base year and the year(s) when the relevant event occurs is reduced. Individuals aged less than 12 and more than 69 paid less than they should have done under “lump-sum” consolidation, whereas the reverse is true for in-between ages. This is consistent with the centrality of the role of pension reforms in the consolidation process, given that comparative advantages seem to be enjoyed by cohorts who were either already retired in 1990 or very far from retirement. At these ages the yearly net tax tends to be negative because of the prevalent use of public services such as health care and education¹⁴.

Even when considering cohorts who paid a comparatively large price for consolidation, the shape of the dashed line in Figure 3 confirms the prominent role of pension reforms. The figure shows two peaks corresponding to ages around 30 and 60, which correspond respectively to cohorts for whom all of the new pension rules will be in force, and those that were close to retirement but not yet retired (at least fully). With respect to the results in Section 3, the changes in the relative size of the sacrifices imposed on these cohorts is noteworthy. In this case, the discounting mechanism implies a comparatively large “excess burden” for those generations close to retirement when reforms were introduced. Despite the advantages of the homogeneity in the comparison examined in Section 3, the

¹³The difference between the generational account of newborns and future generations was 219,698 euros under scenario H, while it is reduced to 27,133 euros under C. All values reported in the paper are in 2008 euros.

¹⁴We choose not to place much emphasis on the comparatively low price imposed on very young cohorts for at least two reasons. First, the early years of life are characterized by a minor interchange between individuals and the public sector, whereas main events such as the payment of personal income taxation and pensions are distant in time and thus less important due to the discounting mechanism. Moreover, few instruments are available to the public sector to impose a sacrifice on these cohorts. Second, since some data, such as consumption and hence on indirect taxation, are only available at the household level, an estimate of average taxes and transfers for these cohorts is sensitive to the choice of the household consumption model.

Figure 3: Residual lifetime net tax under alternative scenarios

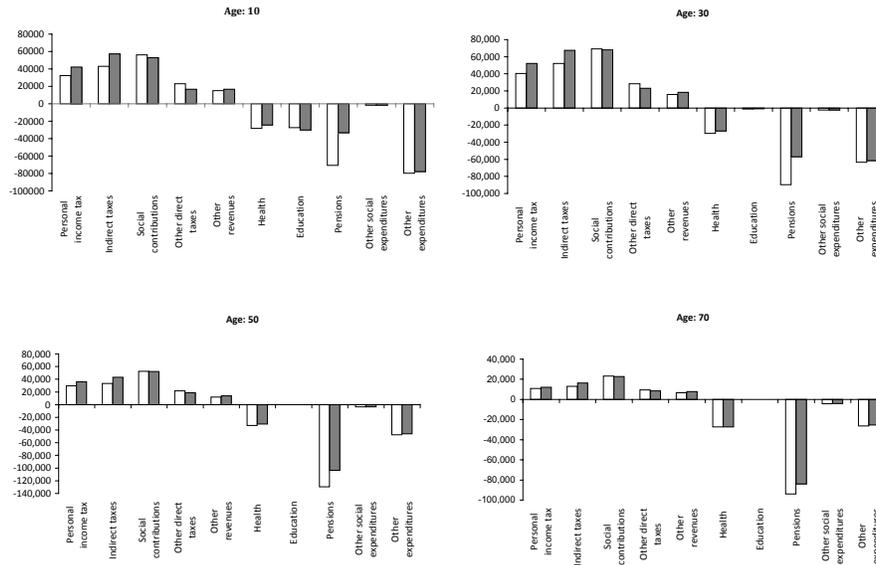


difference in the relative burden of pension reforms deserves further comment. Variability in the discounting weights across generations may in fact be ascribed to economically more interesting differences, such as greater opportunities to revise saving-consumption profiles over the life-cycle for younger generations. The determinants of differences in the impact on net taxes over the life-cycle across generations may be explored by segregating the results of different tax-transfer programmes. For representative cohorts (ages 10, 30, 50, 70), Figure 4 illustrates the net present values of the main aggregations of tax/transfer programmes. The two bars, left and right, refer respectively to scenario H and C.

Regarding taxes, the present value of all taxes paid rises for all cohorts, with increases between 9% and 11% for cohorts aged up to 50. Figure 4 shows that this is mainly due to a significant increase (around 30% for cohorts aged up to 40) in personal income tax. This rise is not due to any specific policy change, as several minor interventions were implemented over the years. The finding is consistent with other analyses¹⁵ which found an overall increase in the incidence of personal income tax, as the government retained revenues because of inflation interacting with a progressive tax scheme (fiscal drag). The composition of other government revenues has been modified: an increase in indirect taxes has compensated for a reduction in social contributions and other direct taxes. This is a result of the introduction of Irap in 1998, a tax (classified as indirect) which replaced the social contributions component - a previous funding source

¹⁵See for example Marino et al. (2009).

Figure 4: Present value of taxes and transfers under Scenario H (white) and C (grey)



of the National Health System. A number of other minor taxes (mainly direct) were also cancelled. The net effect of the recomposition at the individual level is limited for all cohorts. Finally, the increase in “other revenues” reflected the use of additional one-shot taxation to avoid a financial crisis in 1992 and to enter the European Monetary Union in 1998 (Marino et al., 2009).

Figure 4 shows that, independent of age, transfers are lower (in absolute value) under scenario C than under H, the only exception being “education” in the top-left panel, as a result of the aforementioned increase in university enrollment. Several interventions aimed at the containment of health care expenditure, as well as the reorganization of the National Health Service introduced between 1992 and 1999, can explain the reduction of the in-kind benefit related to health care, which is the case for all generations. In percentage terms the impact is greater for young individuals (15% for the newborns, corresponding to 7,183 euros) than for older ages (6% at 60, corresponding to 3385 euros).

This is unlikely to be caused by any specific regulation, but rather the effect of a health care expenditure shift towards the higher ages between 1990 and 2008, due to increased life expectancy. This is only captured by scenario C, for which actual profiles are used for those years, unlike scenario H for which the profile is kept constant over the whole time horizon. Consistent with the discussion in Section 3, Figure 4 shows that the most relevant impact is related to the change in pension entitlements introduced by the two main reforms. This is

clearly reflected in the size of the difference between the present value of pensions received under scenarios C and H. Both the size and the variability across generations are striking in this case. The present value of pension transfers is more than halved for young generations, with cuts of around 50% for all those aged 20 or less (i.e. not older than G_{70}); this essentially corresponds to those cohorts whose pension benefits will be entirely calculated under the new rules. The loss drops off rapidly when moving towards the older cohorts (11% at 70), as the number of individuals within the cohort who at least partially benefit, from the more generous pre-reform system increases¹⁶. Hence, the combination of the design of the pension reforms with limited, if any, impact of consolidation on the present value of transfers related to health care for higher ages and other social expenditure (Figure 4) explains why individuals who were 70 or more in 1990 paid less than they would have under the lump-sum regime (Figure 3). Overall, the results of the present exercise confirm the main insights from Section 3. Improved fiscal sustainability was mainly achieved through an increase in income taxation and pension reforms. The former impacted all cohorts who already received an income during the '90s similarly. Pension reforms provided by far the greatest contribution in terms of sustainability, but their design introduced substantial intergenerational inequality among living generations.

5 Conclusion

The paper investigates the redistributive impact among living generations of the process of consolidation of public finance initiated in Italy in the '90s. We use actual data from several sources for the period 1990-2008 to obtain robust estimates of year-specific age profiles for the main tax and transfer programmes and standard techniques from the generational accounting literature for subsequent years. The main merit of generational accounting methods in comparison with alternative methods for the analysis of the impact of specific policies is that GA provides a comprehensive picture of intergenerational fairness implications of public sector intervention. Since alternative combinations of public spending and taxation reforms, with potentially different intergenerational equity implications, are typically evaluated to meet given budgetary targets, awareness of the relative starting positions of different generations is valuable for the policy maker.

Initially, we calculate net tax rates over homogeneous residual lifetime horizons. Results show that generations born before 1960 enjoy a substantially lower RL-NTR than the younger generations to whom they can be homogeneously compared. For example, the tax rates for the representative individuals born in 1952 and 1970 are 17.4% and 25.6% respectively. The difference tends to disappear when the latter is compared with individuals born in 1988. Generally, the data seem to indicate substantial equity among generations born after 1970.

The role of the shift towards a less generous fiscal regime begun in 1992 in

¹⁶Similar results were obtained by Sartor (2001).

determining intergenerational differences emerging from the first step is also investigated. We show that fiscal policies actually implemented imposed a price on all living cohorts when compared with a hypothetical projection of the pre-1992 fiscal regime, involving both transfer cuts and tax increases. However, the distribution of the price across living generations looks far from equitable. Pension reforms were unambiguously the main structural reforms on which consolidation was based, and their design deliberately introduced intergenerational discrimination. Different rules for benefit definition and higher minimum retirement age were introduced, whose generosity shows a strong inverse correlation with age. The price paid by younger generations to whom all the new rules apply is as large as 50% of the lifetime pension benefit. Since these cohorts approximately correspond to those born after 1970, we conclude that pension reforms introduced in the '90s are central in explaining the sharp increase in residual lifetime tax rates faced by younger generations.

Since essential data for all tax and spending programmes are available until 2008 only, the present paper can not evaluate the effects of decisions recently taken, or still under discussion, in response to the financial crisis. However, at least one decision already taken indirectly provides support for the policy relevance of our results. For individuals who had paid social contributions for at least 18 years by 1995, a new reform has abolished the privilege of having pensions benefits entirely based on the old rules, which had been granted under the previous reforms. Although many workers belonging to those cohorts are exempted from the effects of this reform, having already retired, the reform moves in the direction of closing the intergenerational gap reported in our analysis.

Viewing the differences in lifetime tax rates as an implication of intergenerational inequality, as we do in this paper, is consistent with the generational accounting approach to fairness, under which each generation should pay its own way (Barrell and Weale, 2010). However, other approaches could be adopted: for example, fairness from a social planning perspective (see Romer (1988) among others). In this case, different residual lifetime net tax rates could be made consistent with intertemporal social welfare maximization. Whether the difference between tax rates faced by different generations as estimated in Section 3 can be made consistent with the maximization of any reasonable form of intertemporal social welfare function might be the object of future research.

Acknowledgments

The authors are grateful to Nicola Sartor for making the data used in the first application of generational accounting to Italy (Franco et al., 1993) and in subsequent works (Cardarelli and Sartor, 2000) available to us. The availability of those data was fundamental for the development of the present work. We also wish to thank him for helpful comments. The views expressed in this paper are those of the authors and do not necessarily reflect those of the Banca d'Italia or of the University of Verona. The usual disclaimer applies.

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