PROMETEIA
DISCUSSION
NOTE N. 7

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prometeia
ASSOCIAZIONE

WHAT ITALIAN WORKERS SHOULD EXPECT FROM THEIR PENSION SYSTEM

Main points

- Pension expenditure as a share of GDP has almost doubled in Italy over the last forty years
- Following a number of reforms, the system is now expensive, but is on a more sustainable path
- Nevertheless, there is considerable uncertainty regarding how onerous it will be going forward as the worsening demographic and macroeconomic forecasts have already affected its long-term sustainability
- The most worrying feature is that, in most scenarios, sustainability is correlated negatively to benefit adequacy...
- ...which latter could be well below what workers currently expect
- According to our growth scenario, pension benefits could be between 5 per cent and 20 per cent lower than current official estimates

I. Introduction

"The demographic projections over the long term reveal that the EU is turning increasingly grey in the coming decades".[1] In 2016, age-related public expenditure accounted for 25 per cent of GDP in the EU as a whole and for 28 per cent in Italy, more than half of total public expenditure. The relevance and importance of reliable long-term projections to assess fiscal sustainability are clear. This applies particularly to pensions, which constitute the bulk of age-related costs.

The long-term fiscal sustainability secured by previous pension reforms is being slowly eroded in the face of worsening of demographic and macroeconomic forecasts. This can be seen in the increased share of pension expenditure in GDP in recent forecast updates. In addition, the set of assumptions underpinning these forecasts include a macroeconomic framework, which is likely to be optimistic and will pose risks to both the financial sustainability of the system and retiree benefits.

The Notional Defined Contributions (NDC) pension system was introduced in Italy in 1995, with a slow phasing in, and was intended to respond to the increased population ageing. The system correlates contributions to pensions at the individual level and, based on a combination of policy parameters, at the macroeconomic level. However, NDC systems are not automatically in equilibrium and need routine recalibration to ensure financial stability.

The current NDC system is based on growth expectations which seemed reasonable in the 1990s, but now seem out of date. The financial stability of the Italian NDC system requires long-run real GDP growth to approximate 1.5 per cent, a value that, today, seems not easily attainable

1 *The 2018 Ageing Report, May 2018, European Commission.*

by Italy's economy. In a context where the current social security contributions rate for employees is 33 per cent, the retirement age indexed to life expectations will increase towards 70 years by 2040, and there is zero real indexation of pension benefits, the pension system margins to cope with adverse or unexpected demographic and economic scenarios are extremely small.

This note reassesses pension expenditure projections and expected benefit adequacy according to different macroeconomic scenarios. We will assess current public pension expenditure (Section II) and the long-term projections based on the most recent official scenarios (Section III), and we will compare official macroeconomic assumptions to our forecasts (Section IV) and provide an assessment of the implications of these different growth scenarios for workers' benefits (Section V). Section VI offers some conclusions.

II. Pension expenditure in Italy is high compared to the past and to other similar economies

Pension expenditure accounts for a significant part of the Italian public budget. From 9 per cent in 1980 it increased to 37.3 per cent of current primary expenditure in 2017, equivalent to 30 per cent of total expenditure. Thus, since 1980, the share of pension expenditure in GDP has almost doubled, from 9 per cent to 15.4 per cent (Figure 1).

Italy's public pension expenditure is among the highest in Europe. Compared to other European countries, the predominance of pension expenditure in social expenditure in Italy is marked. Based on the most recent Eurostat data, in 2015 Italy's total social protection expenditure was only slightly higher than the euro area average, while expenditure on pensions exceeded the euro area average by 3.1 percentage points of GDP, the second highest after Greece. As in other EU countries, the main expenditure item was old-age pensions; spending on survivor pensions was also very high, reflecting their relatively larger coverage (Figure 2).

The high share of pension expenditure is due to both the high share of retirees and the relatively generous pension benefits. Total expenditure on old-age pensions and survivor pensions per beneficiary in Italy is among the highest in Europe in nominal terms (around €19,000 compared to the EU average of €15,000), and ranked 4th among the EU-28 when measured as a share of GDP per capita of the population aged over 65 (0.79 per cent compared to the EU average of

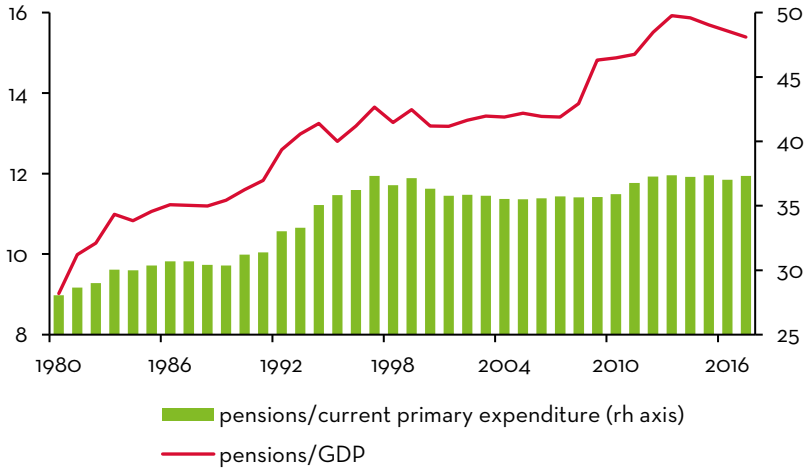
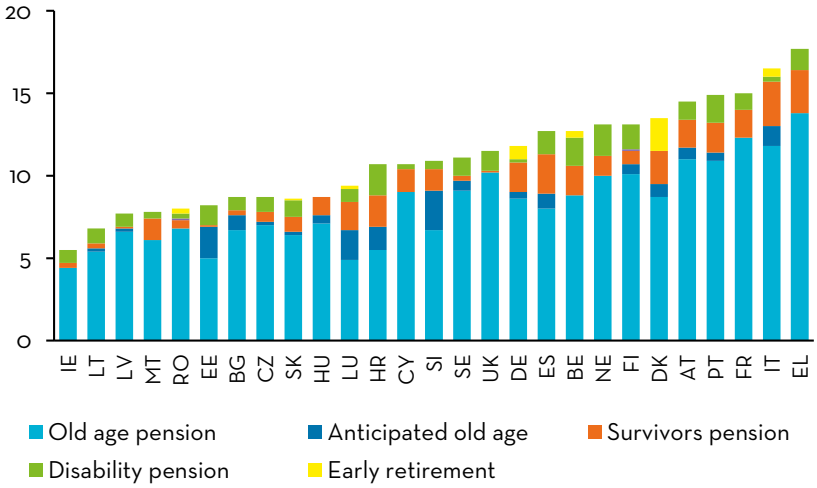


Figure 1

Pensions expenditure in Italy

%

Source: Prometeia's calculations on Istat data.



Source: Eurostat.

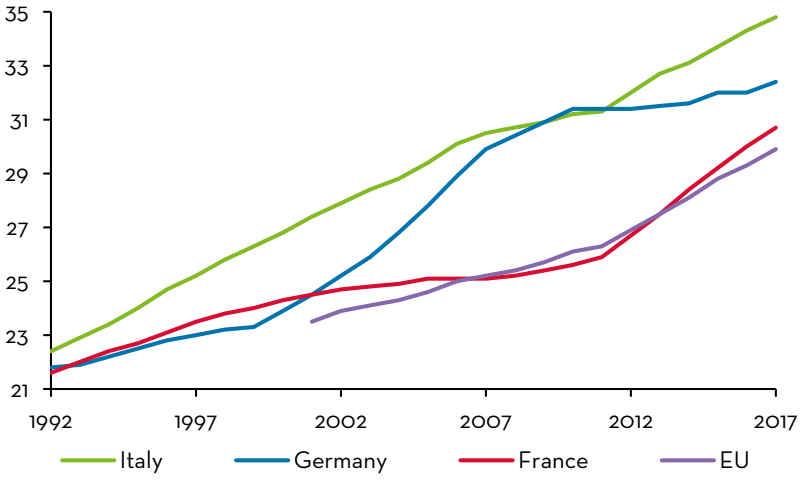
Figure 2

Pensions expenditure in the EU countries

2015
% of GDP

0.68 per cent).[2] The proportion of the Italian population aged 60 or over is the highest in Europe, at 28.4 per cent in 2017 compared to the EU average of 25.6 per cent. Also, in 2017, the old-age dependency ratio (defined as the population 65 and older as a share of the population between 15 and 64 years of age; Figure 3) reached 34.8 per cent in Italy compared to the EU average of 29.9 per cent (32.4 per cent in Germany, 30.7 per cent in France). It should be noted, also, that since the mid 1990s, the effective retirement age in Italy was among the lowest in Europe, which has increased the already relatively higher number of pensioners.

The high level of pension expenditure still ensures a relatively high level of income in old age. The aggregate replacement ratio (i.e., the median individual gross pension income of 65-74 year olds to the median individual gross earnings of 50-59 year olds ratio) increased by 17 percentage points between 2008 and 2016, reaching 68 per cent compared to the EU average of 58 per cent. Similarly, the representative retiree's net replacement rate (i.e., the level of pension income in the 1st year of retirement as a percentage of the individual's earnings at retirement) is 78.4 per cent, higher than in either France (76.3) or Germany (55.4).[3]



Source: Eurostat.

Figure 3

Old-age dependency ratio (65+/15-64)

%

2 *Pension Adequacy Report 2018, European Commission.*

3 *The representative retiree has a 40-year uninterrupted career, ending at the standard pensionable age; Pension Adequacy Report 2018, European Commission.*

III. The Italian pension system is sustainable, but expensive

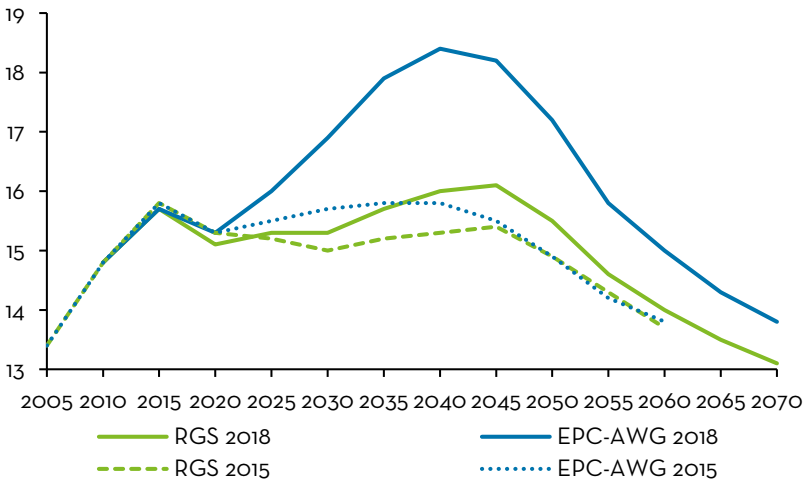
Based on official forecasts the system is sustainable, but burdensome. Projections by the Italian Department of General Accounting (RGS) and the European Commission Working Group on the Financial Effects of Ageing (EPC-AWG)[4], suggest that the ratio of pension expenditure to GDP will be slightly decreasing up to 2020, due mainly to stricter eligibility requirements for old-age pensions and, in particular, alignment, by 2018, of the retirement age for women working in the private sector to that for other workers. In 2040/2045, the ratio of pension expenditure to GDP will peak, reflecting the transition of the baby boom cohort to old age, which will increase the retirees-to-employees ratio, despite the containing effects of the stricter pensions eligibility rules and the expected increased labour force participation. In this phase, the pressure from demographic factors will exceed the declining trend in the benefit level, enabled by the full phasing-in of the NDC scheme. Over the period 2040-2070, the pension expenditure to GDP ratio is expected to decline rapidly, following complete transition to the NDC scheme combined with stabilization of and then decline in the-retirees-to employees ratio after the exit of the baby boom generation.

Official expenditure forecasts have been significantly revised upward recently. Pension expenditure to GDP will increase to 16.0 per cent in 2040 in the RGS scenario and to 18.4 per cent in the EPC-AWG scenario.[5] Comparison with the previous (2015) forecasts reveals a deterioration in demographic prospects, especially net migration.[6] Combined with the downward revision to productivity growth, this leads to a large deterioration of potential growth prospects, especially over the first 20 years of the forecasting period (from an average annual rate of 1.4 to 0.7 per cent in the EPC-AWG scenario) and a worsening of the expenditure to GDP ratio (Figure 4).

Figure 4

Pension expenditure projections

% of GDP



Source: RGS and EPC-AWG.

4 The Italian Department of General Accounting (RGS) issues annual updates to its long-term forecasts of public expenditure on pensions, health care and long-term care as a share of GDP, based on scenarios defined at both the national and European levels. The latter are produced by the Working Group on the Financial Effects of Ageing, set up by the Economic Policy Committee (EPC-AWG) and are the basis for the European Commission's long-term fiscal sustainability monitoring and safeguarding process, the results of which are presented in the afore-mentioned Ageing Report.

5 The RGS scenario incorporates the latest Italian National Statistical Institute (Istat) demographic forecasts (with 2017 as the base year), published in May 2018, and the macroeconomic assumptions prepared for the 2018 update of the Economic and Financial Document of the Ministry of Economy and Finance. The EPC-AWG scenario is based on the demographic and macroeconomic assumptions prepared for the 2018 round of age-related public expenditure projections, based on the latest Eurostat demographic projections (with 2015 as the base year).

6 In the EPC-AWG scenario, the average net flow of migration is significantly smaller than in the 2015 forecasts: over the first 25 years, from an average annual level of 360,000 to 190,000. Thus, the total projected population in 2060, is 9.5 m. lower (-14.3 per cent) and the elderly dependency ratio is 8pp higher.

The ratio of pension expenditure to GDP is significantly higher in the EPC-AWG projections, reflecting significant differences in the macroeconomic assumptions underlying these projections, which imply a less favorable evolution of GDP in the EPC-AWG scenario compared to the RGS one. The lower expected GDP growth more than offsets differences in the average pension benefit, which is lower in the EPC-AWG scenario.[7]

IV. Are the official macroeconomic scenarios too optimistic?

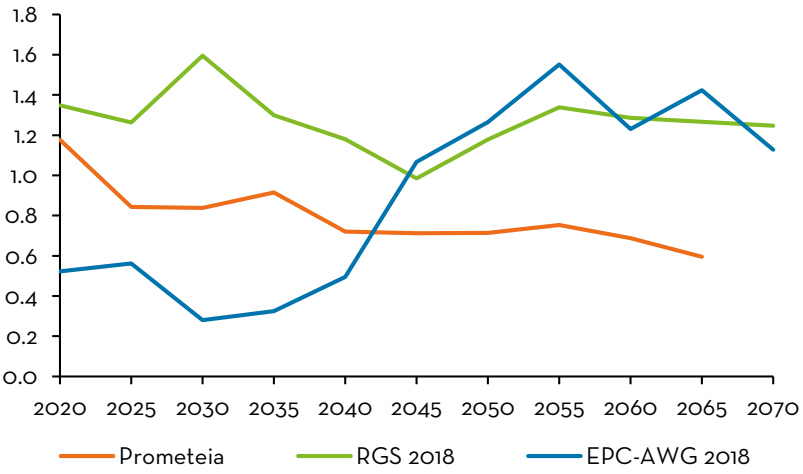
Given the considerable disparity among the official growth projections, we next compare them to our long-term forecasts.[8] These point to a moderate downward trend in Italy's potential growth up to 2065. The negative contribution of labor supply and the declining human capital accumulation over the simulation period are mainly a reflection of demographic trends.[9]

Our long-term GDP forecasts are always lower than RGS forecasts.[10] For the 20 years 2020-2040, average annual GDP growth is projected to be 1.3 per cent in the RGS scenario, compared to 0.9 per cent in our simulations and 0.4 per cent according to EPC-AWG forecasts. After 2040, EPC-AWG and RGS projected growth rates remain quite similar, while they continue to be lower and fairly stable at below 1 per cent in our scenario (Figure 5). These relevant differences depend on disparities in productivity growth: in the EPC-AWG scenario productivity growth remains lower than in the RGS forecasts until 2045 after which they are similar; we expect

Figure 5

Real GDP growth

%



Source: RGS, EPC-AWG and Prometeia's calculations on Istat data.

7 The IMF has recently presented a scenario in which pension expenditure reaches 18 per cent of GDP in 2040 (Italy: Toward a Growth-Friendly Fiscal Reform, IMF WP/18/59). For a recent analysis of the different pension expenditure projections see also: Focus tematico n. 8/28 giugno 2018, Ufficio Parlamentare di Bilancio.

8 Prometeia uses a multi-country structural OLG model for long-term projections for the most relevant macroeconomic variables. The model includes the Italian economy, other advanced countries (USA, Germany, France) and emerging industrialized countries (China, India), as well as areas with long-term development potential such as Africa. See M. Catalano and E. Pezzolla (2016), "The effects of education and aging in an OLG model: long-run growth in France, Germany and Italy", Empirica, 43(4).

9 The human capital index is computed on the workforce education level and growth rate over the simulation period, based on Istat population projections. Educational attainment data are provided by Barro and Lee (2015).

10 Both the RGS and the Prometeia scenarios are based on the revised May 2018 Istat demographic projections. Conversely, the EPC-AWG scenario takes into account the population forecast produced by Eurostat in 2015.

Table 1 Macroeconomic scenarios
(average growth rate of the period, %)

	2020-2040	2040-2065
Real GDP		
Prometeia	0.9	0.7
EPC-AWG 2018	0.4	1.3
RGS 2018	1.3	1.2
Labour productivity		
Prometeia	0.8	1.0
EPC-AWG 2018	0.6	1.5
RGS 2018	0.9	1.6

Source: RGS, EPC-AWG, Prometeia's calculations on Istat data.

productivity to grow at a rather stable level over the entire projection horizon (Table 1).[11] At the same time, the RGS assumes an optimistic long-run unemployment rate, at 5.5 per cent (7.3 EPC-AWG and 6.7 Prometeia). Using the multipliers derived from the sensitivity exercises elaborated by the RGS, pension expenditure in our growth scenario would be 0.9pp of GDP higher than the RGS one on average over the projection horizon, peaking at 17.1 per cent in 2040 and then decreasing to 14.1 per cent in 2070.

V. What do these macro trends imply for benefit adequacy?

Pension adequacy hinges crucially on macroeconomic health. Pay-as-you-go (PAYGO) pension systems redistribute part of the national product from young to old. Therefore, better macroeconomic performance translates easily into higher pension benefits. The relation between GDP growth and adequacy is stronger if the computation of pension benefits is regulated by a NDC formula, as applied to Italy since 1995.

The basic idea of a NDC scheme is to mimic funded pension plans without retaining reserves. Each worker belonging to the system is credited with a notional account, which includes all social security contributions paid during the working years. Since the social security institution uses social security contributions directly to pay pensions rather than investing them in the financial market, they earn an exogenous rate of return defined in the pension law. At each point in time, the worker's account is determined by the sum of past contributions and accrued yields (notional capital). At retirement age, the pension benefit is computed such that the present value of all future expected payments is equal to the accrued notional capital value. Future expected payments, therefore, depend on the individuals' accrued notional capital, expected lifetime, discount rate applied, all at retirement, and on the indexation rule for pension benefits.

Low growth has a negative effect on workers' expected future benefits. Law 335/95, which introduced the NDC pension scheme, set the notional rate of return on social security contributions equal to the 5-year nominal GDP moving average and a discount rate of 1.5 per cent, with pension benefits indexed only to inflation. Thus, other things being equal, a lower GDP growth rate will translate into a lower notional capital and, consequently, lower pension benefits.

There are two main reasons why low growth will affect pension benefits. The first is related to the fact that, in the ten years since the 2008 crisis, average real growth in Italy has equaled -0.5 per cent, not 1.5 per cent. The second is because, as argued in the previous section, GDP growth going forward may be less optimistic than the projections used to forecast pension adequacy.

To estimate the impact of the 2008 economic crisis on future pension benefits we consider the impact of three different scenarios. In the first (Prometeia) scenario, workers' lifetime earnings

11 While in the RGS and EPC-AWG models productivity dynamics are essentially determined by exogenous assumptions, in the Prometeia model they are determined endogenously. The dynamics of labour productivity in the EPC-AWG and RGS scenarios are defined on the basis of a production function methodology that combines labour supply and capital stock, assuming an exogenous dynamic for Total Factor Productivity (TFP). In the Prometeia model, TFP increases due to both capital/labour ratio (capital deepening) and human capital externalities.

and GDP grow in line with historical values, up to 2018, and in line with our estimates thereafter. In the second scenario (1.5 per cent growth), both real GDP and lifetime earnings grow at a rate of 1.5 per cent, in line with the NDC system introduced in 1995. In the third scenario (RGS), lifetime earnings and GDP grow in line with historical values up to 2018, and in line with RGS estimates thereafter.[12] In all three scenarios, we consider retirees that start working between 1995 to 2025 and all retire at age 67 after working for 40 years.[13] Since workers are assumed to start working after 1995, their pension benefit is computed according to the NDC formula.

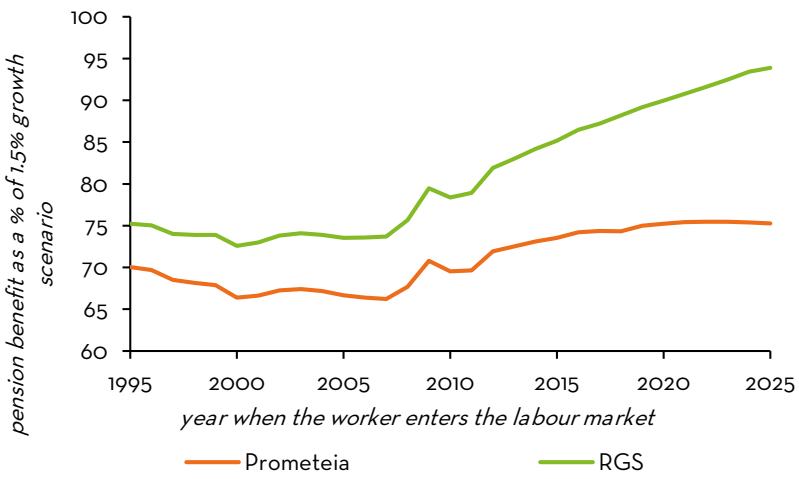
Compared to the 1995 original design of the system, the benefit coverage will be substantially lower. Our and RGS scenarios both produce lower pension benefits than the 1.5 per cent growth scenario by 25-35 percent for workers that have started working before the 2008 crisis (Figure 6). This is because both past and future GDP and past and future real wage growth are below the benchmark value used for the reference scenario of 1.5 per cent.[14] Our scenario highlights a shortfall in pension benefits compared to the RGS one due to differences in expected growth, ranging between about 5 per cent and 20 per cent.

An alternative measure of adequacy is the replacement rate. This indicator is defined as the ratio between the 1st year's pension benefit and the wage in the last working year, for a representative retiree. Although, because of its immediacy, the replacement rate is widely used to indicate adequacy, it must be stressed that it is a ratio (comparing two different growth scenarios implies different values for the pension benefits as well as the final wage). In addition, it is highly dependent on the age at retirement since in NDC systems pension benefits depend on the life expectancy at retirement. Bearing in mind these caveats, we compute the replacement rate for a representative worker who started working during the years 1980 to 2025, based on the hypothesis that workers retire at age 67 with 40 years' seniority.

Figure 6

Ratio between pension benefits computed under different scenarios* with respect to 1.5 per cent growth scenario

%



** On the horizontal axis, we report the first year of work for the representative individual. On the vertical axis the two terms "Prometeia" and "RGS" measure respectively the ratio between pension benefit computed using respectively Prometeia's and RGS projections and pension benefit computed in the 1.5 per cent growth scenario.*
Prometeia = historical values up to 2018 and then Prometeia estimations; RGS=historical values up to 2018 and then RGS 2018 estimations; 1.5% scenario=1.5% growth over all the considered period.
Source: own calculations.

12 *All simulations take into account the fact that, under the Italian law (Law Decree 21st May 2015, n. 65) the notional rate of return in the NDC system cannot be negative (it has a floor at zero).*

13 *We consider only continuous work careers. Late starts, early exits, interruptions to employment and long-term unemployment can as well reduce pension adequacy, but we don't address these issues in this note.*

14 *However, over time, the distance between the 1.5 per cent and the other two scenarios narrows considerably. In particular, at the end of our simulation period, the difference tends to disappear for the RGS as in the RGS scenario growth gets close to 1.5 per cent in the long run (Table 1).*

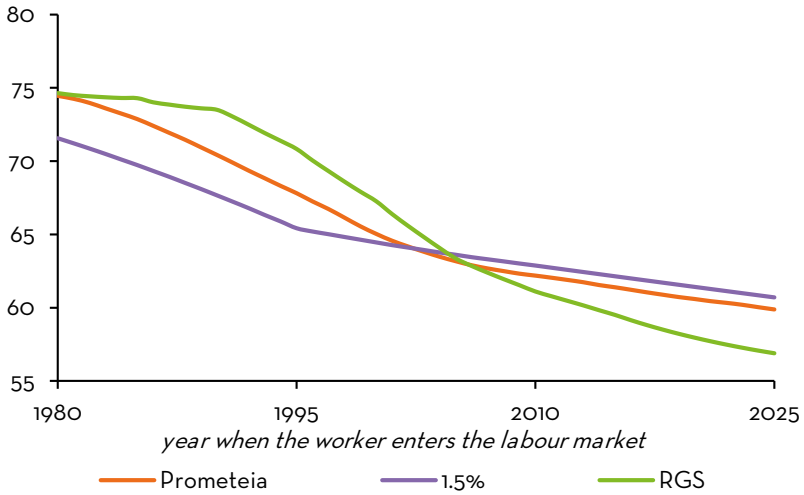


Figure 7

Replacement rate for representative workers*

%

**Prometeia = historical values up to 2018 and then Prometeia estimations; RGS=historical values up to 2018 and then RGS 2018 estimations; 1.5% scenario=1.5% growth over all the considered period.*
Source: own calculations.

In all three macroeconomic scenarios, the replacement rate is expected to fall to around 60 per cent, from between 70 per cent and 75 per cent (Figure 7).[15] Two forces are at work here. The first is represented by the phasing-in of the less generous NDC system. The pensions of workers who entered the labour market before year 1995 will be computed according to a pro-rated formula. The NDC share is increasing through time and, by definition, will reach 100 per cent for those that started working in 1996. The second is the automatic adjustment to incorporate expected increases in life expectancy: the level of pension benefits decreases as life expectancy increases. This allows the NDC system to neutralize longevity risk, but it requires an older retirement age in order to maintain the replacement rate roughly constant. Comparing the replacement rates across the three scenarios shows that this indicator could produce non-uniform and, sometimes, counterintuitive results. In particular it is worth noting that the replacement rate depends, among other factors, on the difference between earnings and GDP growth: the higher the distance the lower is the replacement rate. This explains why in the second period of our

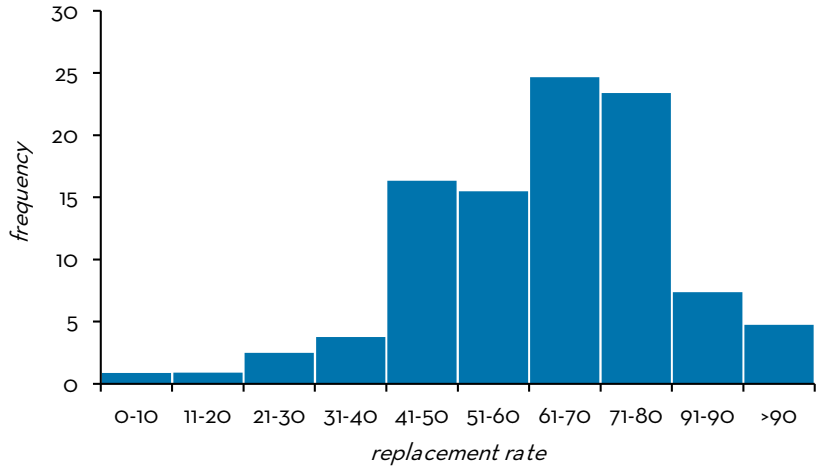


Figure 8

Frequency distribution of expected replacement rate

%

Source: Bank of Italy, Survey on Household Income and Wealth, 2016.

15 *In contrast to Figure 6, here we start the simulation from 1980.*

simulation replacement rates are lower in the RGS scenario, which assumes a labour productivity and wage growth higher than that of GDP.

A substantial number of workers still expect quite high replacements rates (Figure 8). The Bank of Italy's Survey of Household Income and Wealth (SHIW)[16] shows that workers' expected replacement rates from the public pension system have declined following the regulatory changes introduced by past pension reforms, but, for the majority of workers, are still high. Specifically, more than 60 per cent of workers anticipate a replacement rate above 60 per cent which is roughly equal to the level that a worker starting to work after 2010 could expect.

VI. Conclusions

Current Italian pension expenditure as a share of GDP is higher compared to the past and to other European countries, and is projected to increase further. There is also considerable uncertainty regarding how onerous the pension system will become going forward since worsening demographic and growth prospects will affect long-term sustainability and expected pension adequacy. The more pessimistic growth outlook in the latest official projections implies an upward revision of pension expenditure of 0.4 percentage points of GDP on average in the RGS scenario and of 1.6 in the EPC-AWG. Based on RGS multipliers, in our growth scenario pension expenditure will reach 17 per cent of GDP in 2040, more than 1.5 per cent of GDP higher than the current level.

At the same time pension benefits are likely to be below what currently expected. First, the very weak growth performance since 2008 has already reduced expected benefits compared to what the legislator expected in 1995. Also, in our growth scenarios, pension benefits could be between 5 per cent and 20 per cent lower than current official (RGS) estimates. In terms of replacement rates, the difference would be smaller, since living standards (including workers' wages at retirement) decrease with weaker growth.

A combination of a higher effective retirement age than in the past and an increase in employment levels could go a long way in improving pension sustainability and benefits adequacy. More generally, an improvement to growth prospects, with real long-term growth closer to 1.5 per cent, could reduce the rift between pension adequacy and sustainability.

16 https://www.bancaditalia.it/pubblicazioni/indagine-famiglie/bil-fam2016/index.html?com.dotmarketing.htmlpage.language=1. *Massimo Baldini, Carlo Mazzaferro, Paolo Onofri, Pension Expectations, Reforms and Macroeconomic Downturn in Italy. What can microdata tell us?, 2018, Working Paper DSE.*

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