



MINISTRY OF ECONOMY AND FINANCE
DEPARTMENT OF GENERAL ACCOUNTS
General Inspectorate for Social Expenditure

AGEING REPORT 2021 PEER REVIEW ON ITALY - FICHE ON PENSIONS^(*)
(October 2020)

This fiche has been prepared by the Ministry of Economy and Finance, Department of General Accounts (Ragioneria Generale dello Stato), General Inspectorate for Social Expenditure (Ispettorato Generale per la Spesa Sociale) in cooperation with Sogei, Unit for Forecasting Models and Statistical Analysis. For further requests, please contact: Marco Cacciotti (marco.cacciotti@mef.gov.it)

Table of contents

Chapter 1 - An overview of the Italian pension system	3
1.1..... A description of the key elements of the Italian pension system.....	3
1.1.1 Calculation rules.....	4
1.1.2 Eligibility requirements	5
1.1.3 A safety net: the old-age allowance and additional social assistance sums	7
1.1.4 Indexation of pensions.....	8
1.1.5 Accumulation of pension and labour income.....	8
1.1.6 Financing of the public pension system.....	9
1.1.7 Taxation of pensions.....	9
1.1.8 Special Pensions	10
1.2..... Recent pension measures considered in the projections.....	11
1.3..... Actual 'constant policy' assumption used in the projection.....	14
Chapter 2 - Overview of demographic and labour forces projections	15
2.1..... Demographic developments	15
2.2 Labour force.....	18
Chapter 3 - Pension projection results.....	21
3.1..... Extent of the coverage of pension schemes.....	21
3.1.1 Pension expenditure to GDP ratio.....	21
3.2 Net pension expenditure	27
3.3 Pension expenditure by scheme.....	27
3.4 Main driving forces behind pension projections	28
3.4.1 Benefit ratio and economic dependency ratio.....	28
3.4.2 Average replacement rates	30
3.4.3 Old-age and system dependency ratios	31
3.4.4 Pensioners and elderly population.....	33
3.5 New public pension expenditure	34
3.6 Financing of the pension system.....	38
3.7 Sensitivity analyses	40
3.8 Comparison with the previous WGA baseline projections.....	47
Chapter 4 - The projection model.....	49
4.1..... Updating and institutional utilization.....	49
4.2 Methodology	50
4.3 Internal consistency of the model.....	53
ANNEX 1 - Regulatory framework.....	55
ANNEX 2 - Further information requested in the methodological annex.....	62

Chapter 1 - An overview of the Italian pension system

1.1 A description of the key elements of the Italian pension system

The Italian pension system is a public, mandatory PAYG scheme covering the whole resident population. After a transitional phase, which is still ongoing, the same set of rules will apply to all participants, with the exception of minor pension funds and some special categories. Such general rules envisage: i) the adoption of the Notional Defined Contribution (NDC) scheme, with periodic revisions of the implicit accrual rates; ii) the link of eligibility requirements for both old-age and early retirement to changes in life expectancy; and iii) the indexation of pensions to price inflation.

Following Law 214/2011, only one social security institute (*Istituto Nazionale di Previdenza Sociale* - INPS) manages all public pensions schemes, for both the private and the public sectors, with the exception of professionals' funds mentioned above.

Minor pension schemes that are allowed to deviate from the general rules mainly concern professional funds. They account for about 4.5% of the insured to the public pension system and 2.2% of the total public pension expenditure in 2019. However, some of them have already opted for the application of the NDC scheme.

The legal institutional framework of the Italian pension system has been deeply reformed with the introduction of a series of far-reaching interventions starting from 1992. The measures that have contributed the most to improving the financial sustainability of the pension system are the following:

- the elimination of indexation to real wages (Law 503/1992);
- the introduction of the Notional Defined Contribution (NDC) method and the periodic update of the transformation coefficients (accrual rate) to changes in mortality rates (Law 335/1995 and Law 247/2007);
- the tightening of the eligibility requirements for old-age, early, and social assistance pensions (Law 503/1992, Law 335/1995, Law 449/1997, Law 243/2004, as modified by Law 247/2007, Law 214/2011);
- the alignment of the statutory retirement age of women to that of men, thus eliminating the previous 5 year gap (Law 122/2010, Law 214/2011);
- the indexation of the eligibility requirements to changes in life expectancy for old-age, early, and social assistance pensions (Decree Law 78/2010 and Law 214/1995).

1.1.1 Calculation rules

With the 1995 pension reform (Law 335/1995), the Italian pension system moved to a NDC regime, based on the actuarial equivalence between contributions paid and pension payments after retirement. The NDC system is still phasing-in as the legislation foresees its full application to workers who started contributing after 1 January 1996. The previous Defined Benefit (DB) scheme still applies pro-rata to contributions accrued before 2011 for workers with more than 18 years of contribution at the end of 1995 and to contributions accrued before 1995 for workers with less than 18 years of contribution at the end of 1995.

Old-age and early pensions. Under the NDC scheme, the pension is calculated as a product of two factors: the total lifelong contributions, capitalised with the nominal GDP growth rate (five-year geometric mobile average) and the transformation coefficient, the calculation of which is mainly based on the probabilities of death, the probabilities of leaving a surviving spouse, and the average outliving period¹. As a consequence, the pension amount is proportional to the contribution rate and directly correlated to the contribution period and the age of retirement².

According to current legislation, as of 2019, the transformation coefficients are subject to bi-annual revisions according to changes in mortality rates. The most recent update of the transformation coefficients, entering into force as of 2021, has been legislated with the Ministerial Decree of June 2020 published on the Official Journal n.147 of 11 June 2020. It has to be underlined that the revision procedure is automatic as it falls entirely under the administrative sphere of competence³.

Under the previous Defined Benefit (DB) regime, which still applies pro-rata to contributions accrued until 1995⁴, the pension is calculated as a percentage of the reference wage, obtained multiplying 2% by the years of contribution, up to a maximum of 80%. The reference wage is an average of wages/labour income related to the last part of career, indexed to prices up to the year before that of retirement. The number of annual wages involved varies depending on sector, period to which the contribution is referred and retirement age.

Disability pensions. General calculation rules, as described above, also apply to disability pensions. Furthermore, an additional contribution period is granted to those

¹ For formula and parameters, see Annex 1. The transformation coefficient is approximately the inverse of the average number of years for which a pension is expected to be paid to the pensioner and their surviving spouse, with this last component that is weighted with the reversibility rate.

² Until the end of 2012, the transformation coefficients were foreseen only for the age bracket 57-65. For retirement ages below (i.e. disability pensions) or above the range, the lowest and the highest coefficients were respectively applied. As of 2013, the upper limit of the age range has been extended to 70 years and, as of the 2019 update, to 71 years, in line with the increase in the eligibility requirements brought about by changes in life expectancy (see §. 1.1.2).

³ In accordance with the administrative procedure laid down by Law 247/2007, the 2013 and 2016 revisions of the transformation coefficients were adopted by the directorial Decrees of the Ministry of Labour and Social Policies of 14th May 2012 and of 22nd June 2015, respectively. The update of transformation coefficients for the period 2019-2021 has been adopted with directorial Decree of the Ministry of Labour on 15th May 2018.

⁴ It also applies to contributions paid until to 2011 by the insured with more than 18 years of contributions at the end of 1995. It has to be noted that most of them are already retired.

with 100% of disability degree, corresponding to the remaining years to reaching the Statutory Retirement Age (SRA), up to a maximum contribution period of 40 years⁵.

Survivors' pensions. Survivors' pensions account for 60% of the deceased's pension. When the deceased is a contributor, the amount of pension is calculated according to the general rules as described above. Survivor's pensions cannot be cumulated with other income sources for 25%, 40% or 50% of their amount if the survivor's total income exceeds, respectively, three, four or five times the minimum pension.

1.1.2 Eligibility requirements

The Italian pension system provides for two ways for retirement (see table 1 and annex 1):

- the **old-age retirement** which requires the Statutory Retirement Age (SRA) with, at least, 20 years of contributions and, as of 2012, for workers enrolled after 1995, a pension benefit at least equal to 1.5 times the old-age allowance indexed with the five-year moving average of nominal GDP;
- the **early retirement**, at an age below the SRA, which normally requires higher contribution periods.

Statutory Retirement Age (old-age pensions). The current legislation has foreseen the equalization of the SRA between men and women from 2018 at the age of 66, by the gradual increase of the retirement age for women that had started in 2012. The additional increases in SRA that have occurred meanwhile reflected the triannual update of pension requirements for changes in life expectancy. Accordingly, as of 2018 all SRAs are aligned to 66 years and 7 months. In 2019, the SRA has been increased by additional 5 months, to 67 years for all men and female employees to account for the increase in life expectancy at 65.

A similar procedure has been applied for the old-age allowance (*assegno sociale*, or *social pension* if awarded before 1996). Its age requirement has gradually risen to be aligned to that of the SRA in 2018. Accordingly, in 2019, the minimum age requirement to be entitled to the old-age allowance has been further increased to 67 years in line with developments in life expectancy (§. 1.1.3).

Early pension retirement before the attainment of the SRA is possible:

- for all workers, regardless of their age, on the basis only of a minimum contribution requirement. In the period 2016-2018, such contributory requirement was equal to 42 years and 10 months for men and to 41 years and 10 months, for women. In line with the provisions introduced in 2019 (Decree Law 4/2019 as converted into Law 26/2019) for the period 2019-2026, the minimum contributory period to retire early regardless of the age is kept constant to the level of 2018 and not linked to changes in life expectancy. However, the actual pension treatment starts 3 months after the time at which

⁵ In fact, the maximum degree of disability is considered incompatible with any kind of work.

such contribution requirements are met as a shifting retirement windows regime is also applied;

- for workers enrolled after 1995, who may retire up to a maximum of three years earlier than the SRA, if they have accrued at least 20 years of contributions and a pension not inferior to 2.8 times the old-age allowance⁶ in 2012, indexed with the five-year mobile average of nominal GDP;
- Decree Law n. 4/2019, as converted into Law n. 26/2019, set on an experimental basis a new temporary early retirement channel (so-called, Quota100). Workers attaining, during the period 2019-2021, at least 62 years of age and 38 years of accrued contributions may also retire earlier. Private sector workers can retire after 3 months from the time “Quota 100” requirements are met whereas workers of the public sector can retire only after 6 months from the time such requirements are met given a differentiated shifting retirement windows regime for the two sectors.

Automatic indexation to life expectancy of all the pension’s eligibility requirements. As of 2013, all pension and old-age allowance eligibility requirements are periodically updated, every three years up to 2019 and every two years afterwards, to changes in life expectancy at 65, as measured by the National Institute of Statistics (Istat).

As expressly foreseen by the Law, the updating procedure of the pension eligibility requirements is an entirely administrative procedure, thus assuring the effectiveness of the periodic revisions as well as the compliance with the scheduled dates. Such an automatic mechanism is fully consistent with those foreseen for the update of the transformation coefficients to changes in mortality rates (Law 247/2007), in terms of procedures and timing of revisions.

The updates in the eligibility requirements for retirement of 2013, 2016 and 2019 amounting to increases of, respectively, 3, 4 and 5 months, were based on the changes in life expectancy at 65 notified by Istat with reference to the preceding three-year period. The latest administrative procedure for updating the retirement eligibility requirements for the period 2021-2022 to reflect the most recent changes in life expectancy has been concluded on 5 November 2019 establishing, on the basis of data notified by Istat, that no increase was due with respect to 2019 requirements⁷.

⁶ Corresponding to almost 1,200 euro per month in 2012.

⁷ All the 2013, 2016 and 2019 indexation of the eligibility requirements to changes in life expectancy were adopted by a directorial Decree of the Ministry of Economy and Finance and entered into force at least two years before the update of the pension requirements. In line with such administrative procedure, the recent Directorial Decree of the Ministry of Finance, published on the Official Journal of 5 November 2019 and based on data notified by Istat, set no change in pension eligibility requirements due to updates in life expectancy for the period 2021-2022. The previous fiche on the Italian pension system presented for approval at the Working Group on Ageing in November 2019 acknowledged the approval of such Directorial Decree. However, given that there was no time for incorporating this innovation, the 2018 Ageing Report results have been updated still relying on the assumption of the Eurostat population projections with base 2015, which foresaw for 2021 and 2022 an increase of 3 months in pension requirements to reflect the change in life expectancy. Instead, in the current round of projections, in line with what has been established by the Law, the pension requirements for the period 2021-2022 have been kept unchanged with respect to the period 2019-2020 given that no change in life expectancy has been notified ex-post by Istat. The inclusion of such provision results in pension

The Law n. 205/2017 (Budget Law for 2018) has slightly smoothed such indexation mechanism foreseeing that, for future biannual updates in pension requirements starting from 2023, the change in life expectancy has to be computed as the difference between the average of the two reference years minus the average of the two preceding years. The exception is represented by the update of 2021 where the change in life expectancy is computed as the difference between the 2017-2019 average and the value notified in 2016. In addition, the Law n. 205/2017 set an upper limit establishing that future increases in pension entitlement criteria cannot exceed three months. In case the rise in life expectancy exceeds three months, the differential with respect such an upper limit is added in subsequent adjustments. Finally, the law also established that no change in the pension entitlement criteria is due in case of reduction in life expectancy. Such adjustments will be used in subsequent biannual updates to diminish future positive changes in life expectancy.

Disability pension. To be entitled to a disability pension, 5 years of contributions are required, 3 of which accrued in the last five years before retirement.

Survivor's pension. Survivor's pensions are granted to the spouse and/or children of the deceased either pensioner or contributor⁸. As for the latter, 15 years of contributions are required or, alternately, 5 years, 3 of which accrued in the last five years before the decease.

1.1.3 A safety net: the old-age allowance and additional social assistance sums

The Italian pension system provides a safety net for the elderly on low income, regardless of contributions. The safety net consists of two kind of social assistance benefits: the old-age allowance (5,953 euro per year in 2019) and social assistance additional sums (hereafter 'social additional sums' - *maggiorazioni sociali*). Both are means-tested and subject to a minimum age requirement of 67 years in 2019, in line with the SRA requirements, and linked to changes in life expectancy⁹.

The old-age allowance is granted to the elderly with personal income not exceeding the benefit itself and, if married, with couple's income not exceeding twice the benefit.

Social additional sums are provided to supplement the old-age allowance to given income thresholds, depending on age and marital status (single/married). For the 70

requirements that, in 2070, are projected to be 1 month lower than those reported in the 2018 Ageing Report. This pattern is evident in spite of the 2 month increase in life expectancy projected by the 2019 Eurostat demographic projections for 2070 vis-à-vis the 2015 population projections.

⁸ Survivors' pensions can also be entitled to children up to 18 years old (or 26 years, if students).

⁹ Under certain income conditions, further integration (about 40 euro per month) may be provided to the elderly by means of the so-called social purchase card (*carta acquisti*) (art. 82, Decree Law 112/2008, converted into Law 133/2008).

and older, the income thresholds account for 8,442 euro per year in 2019 for a single and 14,396 euro per year in 2019¹⁰ for a couple.

Only under the DB and mixed regimes, besides the old-age allowance, a means-tested, topping-up mechanism to the minimum pension is considered, subject to the fulfilment of the eligibility requirements for an old-age pension.

1.1.4 Indexation of pensions

Pensions are indexed to price inflation, unlike the rule applied before 1992, which also envisaged a partial indexation to real wages for the private sector pensioners¹¹.

According to the current legislation general rule, in force as of 2011, but currently discontinued for a temporary derogation, the percentage of indexation to prices is differentiated by pension brackets. Such a percentage is 100% of the inflation rate for the amount of pension up to four times the minimum pension, 90% for the amount between four and five times the minimum, and 75% for the part above five times the minimum.

However, as mentioned above, such a framework has been subject to several temporary derogations.

Lately, for the period 2019-2022, the Law n. 145/2018 (2019 Budget Law) and then the Law 160/2019 (2020 Budget Law) set new temporary rates for the indexation to price inflation which apply to the total pension amount and not to brackets. The current indexation rates in force until 2022 are the following: 100% for pensions up to 4 times the minimum; 77% for pensions between 4 and 5 times the minimum; 52% for pensions between 5 and 6 times the minimum; 47% between 6 and 8 times the minimum; 45% for pensions between 8 and 9 times the minimum; 40% for pensions above 9 times the minimum.

Since 2022, the general rule mentioned above should be re-established.

It should be noted that such a general indexation rule used for the medium-long term pension projections is, overall, more favourable to pensioners, whereas all the derogations adopted so far have always aimed at reducing pension expenditures.

1.1.5 Accumulation of pension and labour income

Old-age and early pensions. According to Law 133/2008, old-age and early pensions can be cumulated in full with labour income.

¹⁰ For those who have contributed to the pension system, the age threshold of 70 is reduced by 1 year for every five years of contributions and social additional sums are somewhat higher.

¹¹ Since then, pensions, including minimum pension (paragraph 1.1.3), have been indexed only to price inflation.

However, the Decree Law 4/2019 as converted in Law 26/2019 set an explicit restriction to such option for workers retiring early on the basis of the new joint requirements of Quota 100, i.e. with at least 62 years of age and 38 years of contributions. According to legislation, the pension treatments granted under the new eligibility criteria for early retirement cannot be cumulated, up to the moment of accrual of the requirements for being entitled to an old-age pension, with the incomes from employment or self-employment, with the exception of incomes arising from occasional self-employment, up to a limit of EUR 5,000 per year.

Disability pensions. The possibility of accumulation is fully allowed only with 40 years of contributions. Otherwise, the pension is subject to a withdrawal of 50% of the amount exceeding the minimum pension. In any case, the pension amount is first reduced by 25% or 50%, depending on whether the pensioner's full income, including the pension itself, exceeds four or five times the minimum pension.

Survivor's pensions. The accumulation without any curtailment is allowed as long as the pensioner's income, including the pension itself, lies below 3 times the minimum pension. For higher incomes, a reduction of 25%, 40% and 50% is applied for income amounts falling in the brackets of, respectively, three to four, four to five and more than five times the minimum.

1.1.6 Financing of the public pension system

Public pension expenditure is financed through contributions and public budget transfers, mainly covering social assistance provisions.

Contribution rates are differentiated by sector, as below:

- **private and public employees:** 33%, of which about 1/3rd is paid by the employee and 2/3rd by the employer;
- **self-employed (artisans, shopkeepers and farmers):** 24% in 2019;
- **atypical workers:** 33% as of 2018. This rate is reduced to 24% if they are pensioners or contributors to other public pension schemes¹².

The difference in contribution rates between employees and the self-employed is actually lower than it may appear, if expressed in terms of a homogeneous definition of the contribution base. As a matter of fact, the contribution base includes the total contributions in the case of the self-employed, and only the 1/3rd paid by the worker, in the case of employees.

1.1.7 Taxation of pensions

Pensions are taxed as labour-income, allowing for deductions inversely correlated to income levels. Pension income below 8,125 euro per year in 2019 is tax-exempt.

¹² With the exception of professionals not enrolled in professional funds, for which the contribution rate is 25% as of 2017.

In 2019, total revenue on public pensions accounts for about 19.0% of total expenditure which corresponds to nearly 2.9% of GDP.

Contributions paid to the public pension system are fully deductible from the taxable income.

1.1.8 Special Pensions

Although the phasing out of special pension schemes has been intensified particularly with the reform of 2012 (Law 214/2011), a number of these are still in place. In this fiche only the most relevant ones have been analysed for which detailed and consistent data could be extracted. In the Italian system, the two main categories of special pensions concern difficult work conditions and security and armed forces. These three categories comply with the required conditions for special pension status, namely they are: i) allocated based on occupational activity or special status, ii) funded publically, iii) deemed more advantageous than the general scheme.

Difficult conditions. Under this label the following special cases are included:

- i) *arduous works*: dependent workers involved in arduous working conditions as foreseen by law. Retirement is allowed according to the more favourable age and contribution requirements foreseen before Law 214/2011, not indexed to changes in life expectancies up until 2026. For the period 2017-2026, the retirement age could vary between 61 years and 7 months and 64 years and 7 months conditional on a minimum of 35 years of contributions. The privilege is acknowledged on request and is subject to the limit of a given annual amount of resources allocated in the public budget to cover additional costs compared to the main scheme. In case of possible overruns, the privilege of new entrants is correspondently reduced¹³;
- ii) *precocious workers*: dependent workers with at least 1 year of contribution (and actual work) before the age of 19 who present special conditions regulated by law. Compared to the main scheme, early retirement regardless of age is allowed with 41 years of contributions, indexed to changes in life expectancy starting from 2027. The privilege is acknowledged on request and is subject to the limit of a given annual amount of resources allocated in the public budget to cover additional costs compared to the main scheme. In case of possible overruns, the privilege of new entrants is correspondently reduced¹⁴;
- iii) *exposed to asbestos*: dependent workers who a) have contracted an occupational disease; b) have worked in asbestos mines or quarries. Special more favourable rules for contributory period are allowed.

¹³ Normative references for arduous work requirement are: Legislative Decree 67/2011 as amended by Law 232/2016, art. 1, paragraph 206 and by Law 205/2017.

¹⁴ The normative reference for precocious workers is the Law 232/2016, art. 1, paragraph 199, Law 205/2017.

Additional contributions related to the exposition periods to asbestos is also valid for the achievement of the contribution eligibility requirements (particularly, early retirement based on the contribution requirement regardless of age)¹⁵;

- iv) *artistic/entertainment workers*: retirement is allowed as follows: a) old age: 70 and 5 years of contributions or in general a lower retirement age than the SRA and a minimum contribution requirement depending on the category and the applicable pension regime; b) early retirement: either 42 years and 10 months for men / 41 years and 10 months for women of contributions regardless of age. Dancers, choreographers may retire at lower ages¹⁶;
- v) *professional sport workers*: compared to the main scheme, retirement is allowed at lower ages subject to contribution requirements¹⁷.

Security and armed forces. These schemes concern all workers in the armed forces and the police and includes also pilots and flight attendants:

- i) *armed forces and police services*: for periods actually spent in military campaigns contributions are counted more favourably. Early retirement is allowed with: a) 58 years and 35 years of contributions, plus 1 year of "exit window" postponement; b) 41 years of contributions regardless of age plus 15 months "exit window" postponement. Old Age retirement (with 20 years of contributions) varies from the age of 60 years to 66 years, depending on the ranking and position, plus a variable number of months of "exit window" postponement. All requirements are indexed to changes in life expectancy¹⁸;
- ii) *pilots and flight attendants*: compared to the main scheme, retirement is allowed with a lower age (1 year every five year of enrolment in the dedicated pension fund ("fondo volo") up to a maximum of five years and with a minimum contribution year requirement (15/20 years depending on the categories)¹⁹.

1.2 Recent pension measures considered in the projections

The reform of the Italian pension system introduced with the Law 214/2011 (the so-called Fornero Reform), whose legal provisions have been already described in the previous sections, was the most recent structural intervention with relevant financial

¹⁵ The normative reference for legislation on workers exposed to asbestos: Law 257/1992 art. 13, paragraphs 6, 7 and 8 and subsequent amendments.

¹⁶ Normative references: Legislative Decree 708/1947, Legislative Decree 182/1997, Law 214/2011, DPR 157/2013, Law 145/2018, Law 26/2019.

¹⁷ Normative references: Law 336/1973, Law 91/1981, Legislative Decree 166/1997, DPR 157/2013, Law 145/2018, Law 26/2019.

¹⁸ Normative references: Legislative Decree 165/1997, Law 243/2004.

¹⁹ Normative references: Law 859/1965; Law.484/1973, Law 480/1998, Legislative Decree 503/1992; Law.335/1995; legislative Decree 164/1997.

effects in terms of sustainability. The 2012 WGA round of projections and all the subsequent exercises took into consideration such effects. Since the introduction of the provisions of Law 214/2011 only minor changes to the legal framework have been legislated which have relaxed, to a limited extent, some requirements set by the Fornero reform, albeit not modifying its intrinsic structure.

The main interventions already included in the 2018 Ageing Report have been adopted with the 2017 Budget Law and, afterwards, with the 2019 Budget Law, which paved the way for the following introduction of the Decree Law 4/2019 as converted into Law 26/2019.

The 2017 Budget Law set, among other things, new measures aimed at raising pension treatments for specific categories of pensioners such as the 30% increase in the so-called 14th payment (*quattordicesima*), already granted to those with a personal income up to 1.5 times the minimum pension (monthly payment of 750 euro). Such extraordinary payment (but without the 30% increase) was also granted to pensioners with a personal income between 1.5 and 2 times the minimum pension (monthly payment from 750 to 1,000 euro).

Moreover, the 2017 Budget Law has also introduced additional measures to facilitate earlier access to pension in favour of specific categories of workers. Such categories included the so-called 'precocious workers', i.e. those with at least 1 year of actual work before the age of 19. Workers who endured particularly disadvantageous conditions clearly stated by the Law have the possibility to retire earlier regardless of their age conditional to a minimum contribution requirement of 41 years. Other categories identified by the 2017 Budget law were the workers employed in arduous activities (*lavori usuranti*) and a new batch of the so-called safeguarded workers²⁰.

Notably, the above privileges have been acknowledged within the limit of a given amount of planned resources and subject to constant monitoring. In case of overruns, the benefit in terms of lower retirement age is correspondently reduced.

Furthermore, the 2017 Budget Law has also foreseen temporary measures to facilitate earlier exit from the labour market - in any case not before the age of 63 - through the so-called 'APE sociale' consisting of social public assistance benefits (which are not pensions, though included in public expenditure) granted before retirement to workers in disadvantageous conditions stated by law²¹.

²⁰ These workers, included in the so-called 8th safeguard, have been exempted from the application of the eligibility requirements foreseen by Law 214/2011. They benefited from the application of previous eligibility requirements.

²¹ The 2017 Budget Law also introduced the so-called 'APE di mercato', an experimental program in force until the end of 2019, consisting of a loan granted by the bank sector and guaranteed by pension entitlements. The loan (not included in public expenditure) is to be repaid by beneficiaries in 20 years after retirement. The risk of non-repayment is covered by private insurance contracts which need to be concluded before granting the loan and eventually by public contributions. Between January 2018 and June 2019, period for which data are available, about 18,800 requests for voluntary APE (or 'APE di mercato') have been accepted. This measure has not been particularly successful as it is generally quite expensive for the pensioner. The 2017 Budget Law has also foreseen another instrument, the so called 'RITA', which is linked to the 'APE di mercato' in terms of qualifying requirements, though benefits (not included in

Finally, the 2017 Budget Law established that the insured with contribution periods accrued in different funds were allowed to cumulate them all free of charge in order to fulfil the contribution requirements to retire²².

More recently, further interventions, relaxing on a temporary basis the requirements for early retirement, have been adopted with Law 145/2018 (2019 Budget Law)²³ which has set the financial framework for the subsequent interventions implemented through the Decree Law 4/2019 converted into Law 26/2019 that entered fully into force at the end of January 2019.

Such measures, already scrutinized in the WGA peer review on the Italian pension system carried out in November 2019, introduced a new, experimental and temporary, early retirement channel for workers who reach, at least, the age of 62 and a minimum contribution requirement of 38 years in the period 2019-2021 (so-called Quota 100). For workers of the private sector, actual pension payments starts 3 months after the time Quota 100 requirements are met, as a shifting retirement windows regime is also applied. Likewise, a shifting retirement window is in place for workers of the public sector who receive their actual pension payments 6 months after the time Quota 100 requirements are met. According to current legislation, the pension treatments granted under such new eligibility criteria for early retirement cannot be cumulated, up to the moment of accrual of the requirements for being entitled to an old-age pension, with the incomes from employment or self-employment, with the exception of incomes arising from occasional self-employment, up to a limit of EUR 5,000 per year.

The Decree Law 4/2019 intervened also on the early retirement channel based only on accrued contributions and not on age requirements. The minimum contributory period is kept constant to the level of 2018 (42 years and 10 months for men and 41 years and 10 months for women) and unlinked from gains in life expectancy during the year 2019-2026. As before, the actual pension treatment starts 3 months after the accrual of such minimum contribution requirements as a shifting retirement windows regime is also applied.

A similar provision is applied to 'precocious' workers who, as described above, under some specific conditions, may retire early regardless of their age with the minimum contribution requirement of 41 years. Also in this case, such minimum contributory requirement has been unlinked to the updates in life expectancy for the period 2019-

public expenditure) are financed through part of the capital accumulated by workers in their private, funded pension schemes."

²² According to the previous legislation, free of charge accumulation of contributions in different funds was only allowed in case the minimum contribution requirement for an old-age pension had not been achieved in any of the funds.

²³The Law 145/2018 (2019 Budget Law) has, de facto, created an ad hoc fund for the "The revision of early retirement system and to provide for incentives for hiring young workers". Such a fund has been endowed with 7 billion euro as of 2024. The higher pension expenditures stemming from the introduction of the measures foreseen by Decree Law 4/2019 have been financed up to 2023 through the full utilisation of the resources of the Fund. According to current legislation, in the following years the Fund is still endowed with an amount reaching 3.8 billion euro in 2028. Lacking a specific policy provision, such resources have not been pencilled in for interventions on pensions.

2026. As a shifting retirement window is also in place, the actual pension treatment starts 3 months after the time of accrual contributory requirement.

The Decree Law 4/2019 renewed for the year 2019 the temporary program called Opzione Donna, i.e. the experimental regime allowing female workers aged at least 58 (59 if self-employed) and having at least 35 years of social security contributions to retire early. Under this scheme, the actual pension treatment starts 12 months (18 months for self-employed) after the accrual pension requirements as a shifting retirement window regime is applied. In addition, pension benefits are reduced as they are fully calculated according to the Notional Defined Contribution regime.

The Decree Law 4/2019 as converted into Law 26/2019 established also the re-funding of the APE Sociale also for 2019.

Since the most recent peer review of the Italian pension system that was carried out by the Working Group on Ageing in November 2019, no new significant measures have been introduced. The only normative changes that have been set in the meanwhile are those introduced with the Law 160/2019 (2020 Budget Law) which stated the following: 1) a slight revision in pensions indexation, as for the period 2020-2022 the full indexation of existing pension benefits to prices, previously set to 97%, was extended to treatments ranging between 3 times and 4 times the minimum; 2) the Opzione Donna program was financed also for 2020 as was also the APE sociale; 3) finally, the Ministerial Decree of June 2020 published on the Official Journal n.147 of 11 June 2020 enforced the automatic update of the transformation coefficients for the period 2021-2023.

1.3 Actual 'constant policy' assumption used in the projection

According to the current legislation, social pensions and old-age allowances are indexed to price inflation. The law also grants low income elderly additional social sums which are constant in nominal terms. In all these cases, the application of the price indexation rules as laid down by law would imply, de facto, the shrinkage of the value of such social assistance provisions in the long run²⁴. As they play an important role within the public pension system, in the past years, improvements to social assistance benefits have been repeatedly legislated. In order to deal with such issues, the pension model assumes that social assistance benefits, including additional social sums, are indexed to nominal GDP per capita and not to prices, in the mid-long term. However, in the short term up to 2023, pension projections fully comply with the indexation rules foreseen by current legislation.

²⁴ The same considerations apply to the minimum pension, which is only foreseen in the transitional phase for the insured before 1996.

Table 1 - Qualifying conditions for retirement

		Years of contribution		2019	2030	2040	2050	2060	2070
Qualifying condition for retiring with a full pension	Statutory retirement age ⁽¹⁾ - men		67y	67y+8m	68y+6m	69y+4m	70y+2m	71y	
	Statutory retirement age ⁽¹⁾ - women		67y	67y+8m	68y+6m	69y+4m	70y+2m	71y	
	Minimum requirements ⁽²⁾	Contributory period - men	20,00	20,00	20,00	20,00	20,00	20,00	
		Retirement age - men							
		Contributory period - women	20,00	20,00	20,00	20,00	20,00	20,00	
		Retirement age - women							
Qualifying condition for retirement without a full pension	<u>Early retirement under the NDC regime⁽³⁾</u>								
	Early retirement age - men		64y	64y+8m	65y+6m	66y+4m	67y+2m	68y	
	Early retirement age - women		64y	64y+8m	65y+6m	66y+4m	67y+2m	68y	
	<u>Early retirement regardless of age (all regimes)⁽⁴⁾</u>								
	Minimum contributory period - men		42y+10m	43y+2m	44y	44y+10m	45y+8m	46y+6m	
	Minimum contributory period - women		41y+10m	42y+2m	43y	43y+10m	44y+8m	45y+6m	
	Penalty in case of earliest retirement age								
	Bonus in case of late retirement								
	Minimum residence period - men								
	Minimum residence period - women								

(1) The age requirements (and contribution requirements for early retirement regardless of age) are indexed to changes in life expectancy at 65. The update is foreseen every three years until 2019 and then every two years. Changes in life expectancy are consistent with the mortality assumptions underlying the Eurostat demographic projection, with the 2019 as the base year. The 2021 indexation of the eligibility requirements were adopted by a directorial decree of the Ministry of Economy and Finance of 5th November 2019. The next update, which come into force as of 1st January 2023, will be finalized by the end of 2021.

(2) Minimum condition for being eligible to retire is also a pension benefit equal at least 1.5 times the minimum pension of 2012.

(3) Early retirement is allowed with 20 years of contributions and an amount of pension not inferior to 1,200 euro per month in 2012 (2.8 times the old-age allowance, in 2012) indexed with the five-year average of nominal GDP.

(4) For early retirement regardless of age the DL 4/19 suspended the indexation of the requirements until 2026 and introduced a time window of three months. This window is maintained throughout the forecast period.

Chapter 2 - Overview of demographic and labour forces projections

2.1 Demographic developments

According to the Eurostat demographic projections, with 2019 as the base year, total population is expected to shrink by about 10.7% over the period 2019-2070 (Table 2), 1 percentage point more than what projected by the 2015 Eurostat demographic projections, underpinning the previous 2018 Ageing Report. Such a decrease mainly depends on the demographic transition (the ageing of the baby boom generations), on which the adoption of more conservative assumptions on fertility also weighs.

In the latest Eurostat demographic projections, the total fertility rate (TFR) has been revised significantly downwards. In 2019, the consolidated rate is slightly lower than what was previously forecast (1.31 vis-à-vis 1.36). Over the projection period, the TFR is assumed to grow linearly but at a more moderate pace than previously assumed. As a result, at the end of the forecast horizon, in 2070, the initial gap almost triples with the rate being 1.52 vis-à-vis the previous 1.66.

Net migration is assumed to show a more sustained profile than what projected before. In the current Eurostat population projections the net annual flow of migration amounts, on average, to 212 thousand units between 2019 and 2070 vis-à-vis the 191 thousand units previously projected. Net migration is expected to increase in the period 2019-2025 reaching the peak of 228 thousand units. Afterwards, it is projected to decline until 2070 where it settles on 207 thousand units vis-à-vis an amount of 164 thousand migrants reported in the past round of projections.

Over the forecast period, life expectancy at birth increases almost in line with previous projections by 5.7 years for men and 5.2 for women and moves, respectively, from 81.3 to 87.0 years and from 85.7 to 90.9. Life expectancy at 65, which better approximates the age of retirement, rises by 4.3 years both for men and for women.

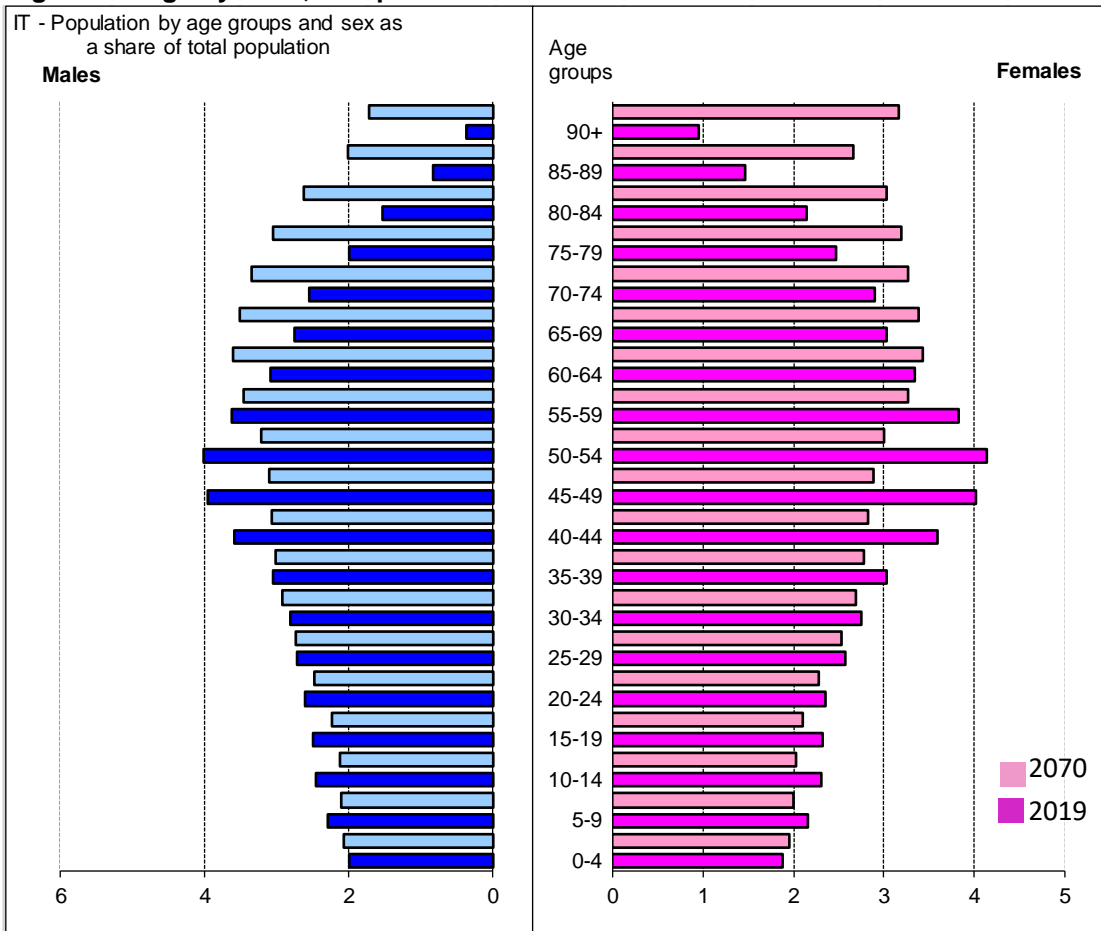
The transition of the baby boom generations coupled with the longevity gains and with low fertility rates are the driving forces accounting the most for the significant ageing of the population. This is shown in figure 1 which compares changes in the age structure between the base year and the end of the forecasting period. More specifically, the old-age dependency ratio (population of 65+ as a share of population 20-64) increases from 38.9% in 2019, reaching a peak of 66.5% in 2050 corresponding to the transition of the baby boom cohorts at older age, and it ends up to 65.6% in 2070, signalling a potential strong impact of the ageing on related expenditure items.

Table 2 - Main demographic variables

Demography	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-2070
Population ('000)	60.323	59.923	59.333	58.035	55.874	53.874	60,323	2019	-6.449
Population growth rate	-0,2	-0,1	-0,1	-0,3	-0,4	-0,3	-0,03	2025	-0,1
Old-age dependency ratio (pop65+/pop20-64)	38,9	48,0	61,4	66,5	65,5	65,6	66,5	2050	26,7
Old-age dependency ratio (pop75+/pop20-74)	16,7	19,7	25,2	32,8	33,5	32,1	34,1	2055	15,4
Ageing of the aged (pop80+/pop65+)	31,7	32,2	32,6	41,0	45,8	43,5	45,9	2059	11,8
Men - Life expectancy at birth	81,3	82,6	83,8	84,9	86,0	87,0	87,0	2070	5,7
Women - Life expectancy at birth	85,7	86,9	88,0	89,0	90,0	90,9	90,9	2070	5,2
Men - Life expectancy at 65	19,6	20,5	21,4	22,3	23,1	23,9	23,9	2070	4,3
Women - Life expectancy at 65	22,9	23,8	24,7	25,6	26,4	27,2	27,2	2070	4,3
Men - Survivor rate at 65+	90,0	91,5	92,6	93,6	94,4	95,1	95,1	2070	5,0
Women - Survivor rate at 65+	94,2	95,1	95,7	96,3	96,7	97,1	97,1	2070	2,9
Men - Survivor rate at 80+	64,9	69,4	73,1	76,3	79,3	81,9	81,9	2070	16,9
Women - Survivor rate at 80+	78,9	82,0	84,4	86,5	88,4	90,0	90,0	2070	11,1
Net migration ('000)	134,7	224,0	217,2	214,3	210,5	206,6	228,4	2025	71,8
Net migration over population change	-1,4	-5,8	-2,7	-1,2	-0,9	-1,3	-0,9	2060	0,1

Source: EUROSTAT and Commission Services.

Figure 1 - Age Pyramid, Comparison between 2019 and 2070



Source: Eurostat and European Commission

2.2 Labour force

Under the current scenario, labour forces (20-74) are projected to decrease by 11.6% over the period 2019-2070, whereas in the 2018 Ageing Report forecasts, as updated in November 2019, labour forces were assumed to decline by 14.4%. In both cases, the shrinkage in labour force is mostly explained by the reduction in the working age population.

Against this backdrop, the total participation rate in the age bracket 20-74 significantly increases by 5.6 percentage points from 60.7% in 2019 to 66.3% in 2070, 1.7 percentage points higher than the corresponding rate calculated on the basis of the 2018 Ageing Report projections. In spite of the new measures that made early retirement more easily accessible on a temporary basis, the gains in participation rates are still fully explained by the evolution of older workers' participation rates, which are greatly affected by changes in the eligibility requirements and by the phasing-in of the NDC regime. In particular, participation rates rise from 57.5% in 2019 to 77.9% in 2070, in the age-class 55-64, and from 6.1% to 32.6% in the age-class 65-74 (Table 3). *Vis-à-vis* the 2018 Ageing Report, the participation rates of elderly workers (55+) are now significantly higher due to the update of the initial entry/exit rates. In particular, the use of average data over the period 2009-2018 *vis-à-vis* the 2006-2016 data used in the previous round resulted in both higher entry and significantly lower exit rates. Lower exit rates are overall explained by the gradual increase in pension requirements and by the alignment of the retirement criteria for women to those for men that occurred in 2018.

As shown in tables 4.a and 4.b, the average labour market exit age resulting from the Cohort Simulation Model (CSM) increases in line with the periodic updates of the eligibility requirements. At the end of the forecasting period, the average labour market exit age is 68.5 for males and 69.3 for females. A similar pattern is visible for the projected average total retirement age, which, as required by the current legislation, evolves in line with developments in longevity (Figure 2).

Notwithstanding the steady increase in the average labour market exit age, the labour market will face a rapid and significant contraction in the labour force mainly caused by the demographic transition. Within this pattern, a partial compensation for the reduction in the working age population will stem from the expected changes in female and old-age employment. From 2019 to 2070, apart from the contraction of 2020 due to the macroeconomic effects of the Covid pandemic, total employment in the class 20-74 is projected to increase at an average annual rate of about 0.1%, mostly driven by the female contribution, which is expected to increase, on average, by 0.2 percentage points.

Table 3 - Participation rate, employment rate and share of workers

	2019	2030	2040	2050	2060	2070	Peak value	Peak year	Change 2019-2070
Labour force participation rate 20-64	70,5	72,8	74,1	74,5	74,5	74,9	74,9	2070	4,4
Employment rate for workers aged 20-64	63,6	66,3	68,2	69,4	69,4	69,8	69,8	2070	6,2
Share of workers aged 20-64 on the total labour force	90,2	91,1	92,1	93,1	93,2	93,2	93,2	2059	3,1
Labour force participation rate 20-74	60,7	62,5	62,2	64,3	65,8	66,3	66,3	2070	5,6
Employment rate for workers aged 20-74	54,8	57,1	57,6	60,1	61,6	62,1	62,1	2070	7,3
Share of workers aged 20-74 on the total labour force	90,3	91,4	92,5	93,5	93,7	93,7	93,7	2070	3,4
Labour force participation rate 55-64	57,5	69,4	72,2	73,3	74,4	75,9	75,9	2070	18,4
Employment rate for workers aged 55-64	54,4	66,1	69,2	70,6	71,6	73,2	73,2	2070	18,8
Share of workers aged 55-64 on the total labour force	94,6	95,2	95,8	96,3	96,4	96,4	96,4	2070	1,8
Labour force participation rate 65-74	9,1	18,8	21,0	24,1	29,5	32,6	32,6	2070	23,5
Employment rate for workers aged 65-74	8,9	18,3	20,6	23,7	29,0	32,1	32,1	2070	23,2
Share of workers aged 65-74 on the total labour force	97,6	97,6	97,9	98,2	98,3	98,3	98,3	2070	0,7
Median age of the labour force	44,0	45,0	45,0	45,0	46,0	46,0	46,0	2028	2,0

Source: Commission Services.

Table 4a - Labour market entry age, exit age and expected duration of life spent at retirement - Male

	2019	2030	2040	2050	2060	2070	peak value	peak year	change 2019-2070
Average effective retirement age (administrative data)*	63,1								
Average labour market exit age (CSM)**	65,2	66,0	66,4	67,0	67,8	68,5	68,5	2070	3,2
Contributory period	36,9	36,4	36,3	35,7	37,0	38,3	38,6	2063	1,4
Duration of retirement***	19,6	19,7	20,6	20,6	20,5	21,2	21,2	2069	1,6
Duration of retirement/contributory period	0,5	0,5	0,6	0,6	0,6	0,6	0,6	2049	0,0
Percentage of adult life spent in retirement****	29,3	29,1	29,8	29,6	29,2	29,6	29,8	2040	0,3
Early/late exit*****	2,0	1,7	2,9	2,3	2,3	3,2	2,9	2040	1,2

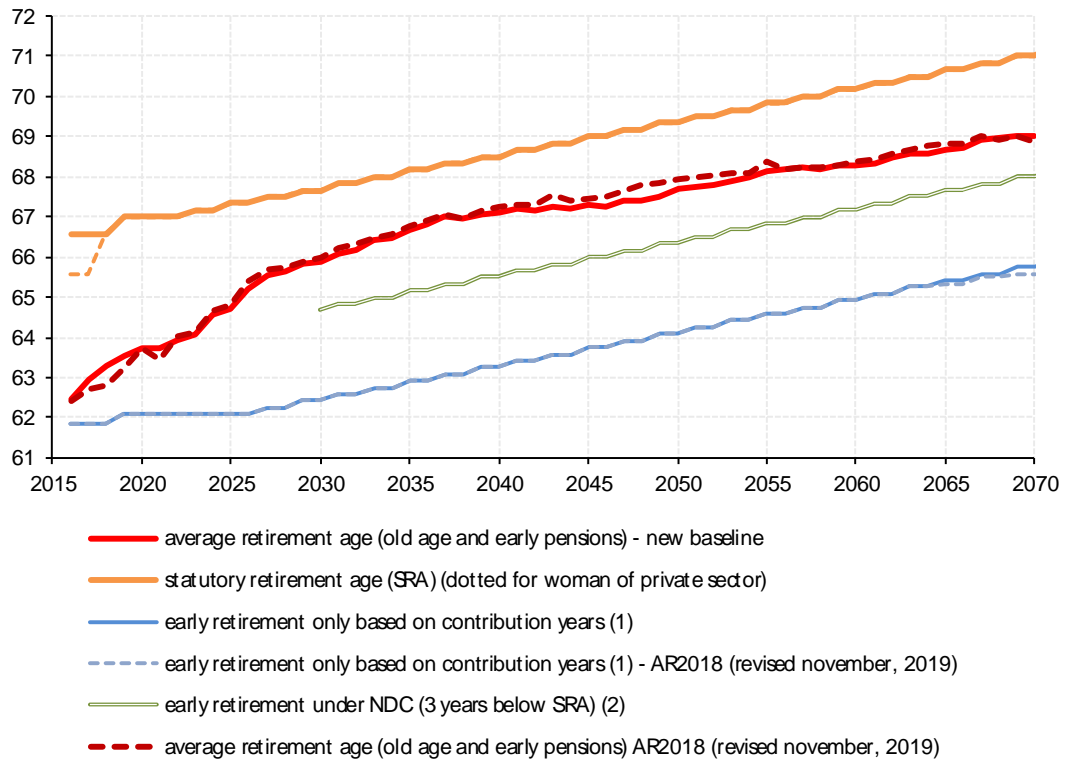
Table 4b - Labour market entry age, exit age and expected duration of life spent at retirement - Female

	2019	2030	2040	2050	2060	2070	peak value	peak year	change 2019-2070
Average effective retirement age (administrative data)*	63,3								
Average labour market exit age (CSM)**	65,8	66,9	67,6	68,2	68,8	69,3	69,3	2070	3,5
Contributory period	34,7	33,8	34,0	34,3	36,1	37,8	37,8	2070	3,1
Duration of retirement***	22,0	22,1	22,0	22,9	22,7	23,5	23,5	2070	1,5
Duration of retirement/contributory period	0,6	0,7	0,6	0,7	0,6	0,6	0,7	2037	0,0
Percentage of adult life spent in retirement****	31,5	31,1	30,7	31,3	30,9	31,4	31,5	2020	-0,1
Early/late exit*****	3,2	1,4	2,4	1,5	1,6	2,4	3,2	2020	-0,8

Source: Commission services

* The effective retirement age shows the age at which people on average start receiving an old-age pension benefit. It is calculated on the basis of the administrative data for 2019 (see Annex Tables A4a and A4b); ** The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; *** 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; **** The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 20 years; ***** Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Figure 2: Eligibility requirements and average retirement age



(1) The age has been calculated assuming a full career, without interruptions, starting at 19 for males and 20 for females. In this sense it can be seen as a 'minimum age'. However, given the increasing delay the younger cohorts of workers enter the labour market, in the long run the contribution requirement will be achieved at much older ages.

(2) Though currently in force, it actually becomes effective around 2030.

Chapter 3 – Pension projection results

3.1 Extent of the coverage of pension schemes

Pension projections cover the total pension expenditure for old-age, disability and survivors' pensions related to contributions paid to the public pension system plus the old-age allowances and social additional sums because of their close relation with ageing. In fact, these last items are only granted to the elderly with low income.

The aggregate of pension expenditure adopted in the projections is slightly lower than the one produced by Eurostat (ESSPROS statistics). The difference, which in 2018, the latest available figure, accounts for slightly above 0.6% of GDP (Table 5), is due to: benefits entitled to survivors and the disabled (0.5 percentage points in terms of GDP) which are related neither to pension contributions nor to ageing (benefits paid to the disabled below the SRA, war pensions, work injury annuities and merit awards); supplementary pensions provided by private pension funds (0.1 percentage points in terms of GDP) which fall outside the perimeter of the public pension system.

The fact that the State runs no risk on the financial returns of private pension schemes explains the exclusion of these component from the projections. Private pension funds are never mandatory, regardless of their being occupational pension schemes or not. Private pension funds never replaces the coverage of the public pension system, which is compulsory for all workers (no opting out). A quota of the capital accumulated in private pension funds (up to 50%) may be withdrawn as a one-off reimbursement at the retirement (or even before, to finance particular expenses, such as home purchasing). Private pension funds play a supplementary role to the public pension system providing a minor fraction of elderly income. This implies that workers, who join private pension funds on voluntary basis, accept all the risks concerning the financial returns, since the public pension system in any case provides them with an adequate pension income. For an overview on complementary pensions in Italy it is possible to refer to the data reported in the Annex 2.

3.1.1 Pension expenditure to GDP ratio

Table 6 shows the projected ratio of pension expenditure (gross of tax revenues) to GDP obtained on the basis of the current WGA baseline scenario. Figure 3 presents the whole projections results in comparison with the 2018 Ageing Report baseline scenario as revised in November 2019 following the Italian peer review carried out to assess the measures introduced with the Decree Law 4/2019.

Over the period 2017–2018, notified data on public pension expenditures as a ratio of GDP in the definition adopted by the WGA are lower than the corresponding figures presented in the 2018 Ageing Report. The difference amounts to 0.4 percentage points of GDP both in 2017 and in 2018. The lower incidence of public pension expenditures to

GDP is explained by the higher level of actual GDP but also by the lower number of existing pensions. With respect to the figures of the 2018 Ageing Report, the number of total pensions is lower by 145 thousand units in 2017, 216 thousand in 2018. Given the tightening of the eligibility requirements for old-age and early pensions and, in particular, the alignment of the SRA of women in the private sector to that of other workers foreseen by the law starting from 2018, the lower number of treatments is the result of recent notified data that revised downward previous forecasts..

In 2019, with the measures favoring early retirement introduced with the Decree Law 4/2019 entering into force, the public pension expenditure accounts for 15.4% of GDP, increasing by 0.2 percentage points with respect to 2018 but at the same time being 0.4 percentage points below the corresponding year of the previous round projections.

Table 5 - Eurostat (ESSPROS) vs. Ageing Working Group definition of pension expenditure (% GDP)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	change 2009-2018
Eurostat total pension expenditure	15,4	15,4	15,4	16,0	16,5	16,4	16,4	16,0	15,8	15,8	0,40
Eurostat public pension expenditure (A)	15,2	15,2	15,2	15,8	16,3	16,2	16,2	15,8	15,6	15,6	0,43
Public pension expenditure (AWG: outcome) (B)	14,7	14,7	14,8	15,3	15,8	15,8	15,6	15,4	15,2	15,2	0,54
Difference Eurostat/AWG: (A)-(B)	0,5	0,5	0,4	0,5	0,5	0,4	0,6	0,4	0,4	0,4	-0,11
Expenditure categories not considered in the AWG definition vs Eurostat total pension expenditure:	0,7	0,7	0,6	0,7	0,7	0,6	0,8	0,6	0,6	0,6	
- Benefits paid to the disabled and the deaf and dumb below SRA, war pensions, work injury annuities and merit awards	0,6	0,5	0,5	0,5	0,5	0,5	0,6	0,5	0,5	0,4	
- Survivors' war pensions and survivors' work injury annuities	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	
- Supplementary pensions paid by private pension funds	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	

Source: EUROSTAT and Member States.

Table 6 - Projected gross and net pension spending and contributions (% of GDP)

	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-
Expenditure									
Gross public pension expenditure	15,4	17,3	17,8	16,2	14,1	13,6	18,0	2036	-1,8
Net public pension expenditure	12,5	14,0	14,4	13,1	11,4	11,0	14,6	2036	-1,5
Contributions									
Public pension contributions	10,7	11,0	11,0	11,1	11,1	11,0	11,59	2020	0,2

Source: Commission Services.

Afterwards, the ratio of pension expenditure to GDP increases sharply reaching a peak of 17.3 per cent in 2020 and then decreases in the following two years reaching the level of 16.3 per cent in 2022. Spending in relation to GDP grows significantly due to the severe decline in GDP levels due to the impact of the pandemic emergency hitting Italy since last February. However, the upward trend is also the result of the measures contained in the Decree Law 4/2019 as converted into Law 26/2019 (so-called Quota 100), which, by favouring early retirement, determine for the years 2019-

2021 a substantial increase in the number of pensions in relation to the number of employees.

With regard to short term results, it should be noted that the increase in pension expenditures to GDP ratio reported in 2019–2021 is in line with the figures on the ex post monitoring of the costs of Quota 100 foreseen by the Decree Law 4/2019 as converted into Law 26/2019.

The initial estimates of the take up rate²⁵ of Quota 100, carried out by the Italian Social Security Institute (INPS) and presented in the Technical Report to the Parliament accompanying the Draft of the Decree Law 4/2019, showed that the number of new pensioners retiring with the new requirements would have been 290.000 in 2019, 327.000 in 2020, 356.000 in 2021. With respect to those estimates, the surveillance activity on the applications presented so far (June 2020) has proven that for 2019, the actual number of applications is 130.000 units less than initially estimated. However, during 2020, the number of Quota 100 applications is rising faster and should reach the total level of 300.000 units by the end of this year. With respect to the estimates of the Technical Report, the number of applications is not expected to be significantly lower and would be only more evenly distributed²⁶ over the period 2019–2021.

²⁵ The underlying initial assumption on the take up rate of Quota 100 carried out by INPS was the following: for 2019, a take up rate of 100% for the dormant contributors (silenti), 85% of the potential applicants in the case of workers of the private sector and 70% of the potential applicants for public sector workers. For the following years, for those who had qualified for early retirement with Quota 100 requirements but decided not to opt for this possibility, the assumption of the take up rate was 40% of the potential applicants in case of workers of the private sector and 45% of the potential applicants for public workers.

²⁶ It has to be noted that, the DL 4/2019 gives to workers being at least 62 years old and having at least 38 years of contribution in 2019–2021 a subjective right. Accordingly, they have the faculty to retire with Quota 100 criteria even after 2021. Against this background, there is still no clear explanation regarding the reasons for such a lower take-up rate in 2019. It is likely that the restriction established by the Law on the cumulability between the pension obtained with Quota 100 criteria and income from work may have discouraged potential applicants. Another reason for the limited appeal of Quota 100 in 2019, may be due to the reduction in pension benefits as a consequence of the earlier retirement. The innovation of Quota 100 concerns mostly pensioners retiring with the mixed regime. For them, retiring earlier with Quota 100 would imply a pension benefit that is expected to be 3% lower for any year of anticipation under the notional contribution scheme and 2% lower for any year of anticipation under the earnings-related regime with respect to the amount of pension that they would have obtained on the basis of previous higher requirements. In addition, pensioners that retire earlier according to the Quota 100 requirements bear the deadweight costs of losing the underlying growth in nominal wage that would amount to around 3% for every year of anticipation with respect to previous legislation requirements.

Figure 3: pension expenditures percentage of GDP and its decomposition - WGA 2021 Baseline projection

Figure 3.a: percentage ratio of expenditure to GDP

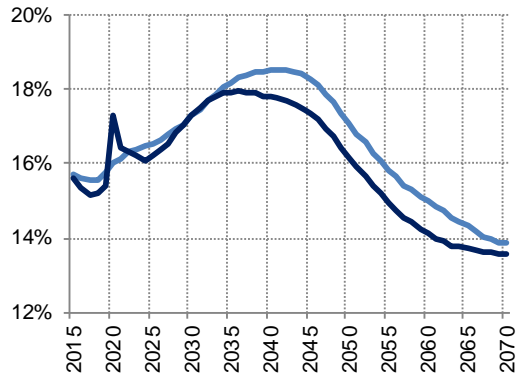


Figure 3.d: percentage ratio of pensions to people of 70+

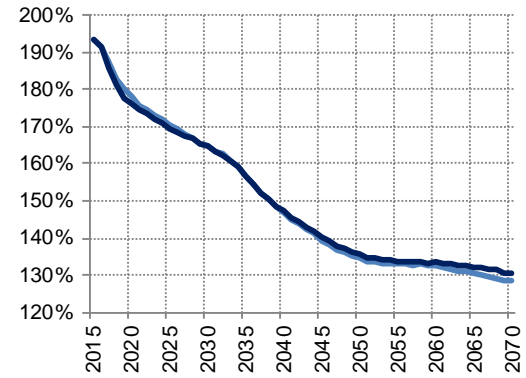


Figure 3.b: percentage ratio of average pension to productivity

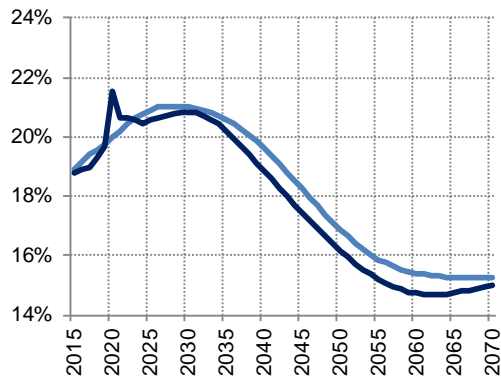


Figure 3.e: percentage ratio of employees to population [20-69]

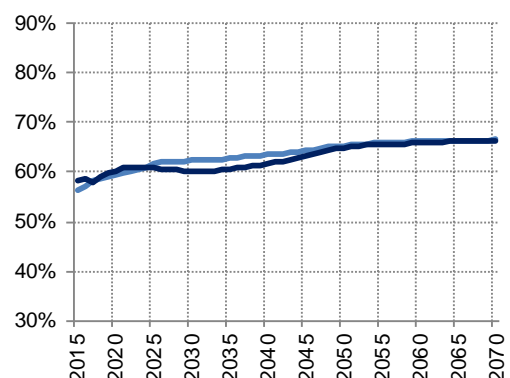


Figure 3.c: percentage ratio of pensions to employees

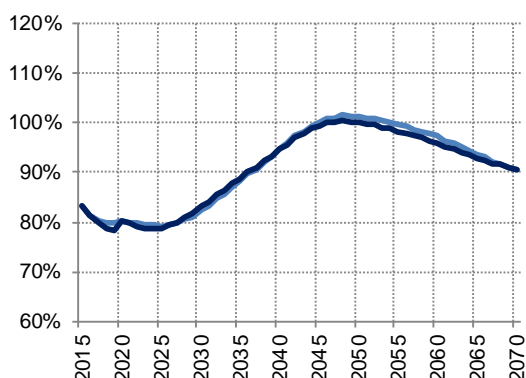
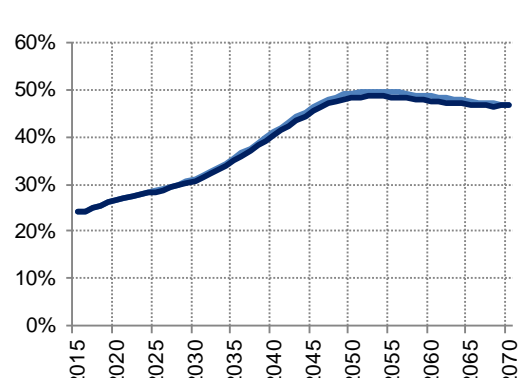


Figure 3.f: percentage ratio of people of 70+ to population [20-69]



— AR 2018 (revised November, 2019) — AR21

In the period 2022–2025 the ratio between pension expenditure and GDP declines slightly thanks to a partial recovery in employment levels reaching the value of 16.2%. After 2025, the ratio increases steadily up to the peak of 18% of GDP in 2036. Afterwards, pension expenditures as a ratio of GDP declines progressively reaching the value of 16.2% in 2050, then converging to 14.1% in 2060 and ending up to 13.6% of GDP in 2070. Overall, the pension-to-GDP ratio is expected to decline by 1.8 percentage points during the projection period 2019–2070.

The growth in the central part of the forecast period is due to the simultaneous contribution of several factors. On the one hand, pension expenditure/GDP is pushed up mostly by the unfolding of the first negative effects of the demographic transition due to the retirement of the baby boom cohorts. Such an effect is, de facto, reinforced by the recent measures adopted with Decree Law 4/2019 as converted in Law 26/2019 which, for the period 2019–2026, provide for the discontinuation in the updates to life expectancy for the minimum contribution requirement for the channel of early retirement based only on accrued contributions. In 2026, at the timing of expiring of such a measure, the minimum contribution requirement for early retirement would be 6 months lower on a permanent basis, resulting in a higher number of new pensions. Such underlying patterns will contribute to increase the ratio between the number of pensions and the number of employees.

On the other hand, such upward trend in expenditure is only partially offset by the increase in the minimum requirements for access to retirement and by the lower average pension benefits deriving from the anticipation in retirement. In this phase, the pressure of demographic factors exceeds the declining trend in the benefit ratio that comes about from the gradual introduction of the NDC scheme over the entire working life and from the anticipation in retirement.

The transition from the DB to the NDC scheme is shown in figure 4, where the new pensions are broken down in three components referring, respectively, to workers almost fully covered by the DB scheme (at least 18 years of contributions in 1995), workers under the mixed pro-rata scheme (less than 18 years of contributions in 1995), and new entrants after 1995. As can be seen, old-age and early retirements of the first group will be almost over as of 2020–2025, when retirements of the second group, whose pensions are increasingly calculated with the NDC method, become predominant which goes in parallel with the demographic transition up to 2040–2045, thus mitigating the financial impact. As expected, for disability pensions the transitional process is somewhat accelerated, due to lower contribution records at retirement.

The rapid contraction in pension expenditure to GDP ratio over the final part of the forecasting period is imputable to the full application of the NDC scheme, which runs together with the stabilisation and subsequent decline in the ratio of pensions to employees. This last phenomenon mainly arises from the gradual exit of the baby

boom generations whose effect is further reinforced by the operating of the automatic adjustment of eligibility requirements to changes in life expectancy.

In spite of the different starting point, the current pension expenditure projections as a ratio of GDP are somehow aligned to those of the 2018 Ageing Report until 2032. Afterwards, the current pension-to-GDP projections continue on a lower trend than what projected for the 2018 Ageing Report. Between 2032 and 2070, the gap between the two curves amounts on average to 0.7 percentage points of GDP and it is mostly imputable to the smaller ratio between the average pension value and labour productivity projected in the current estimation round²⁷.

Figure 4: new old age, early pensions and disability by schemes

Figure 4.a: old age and early pensions

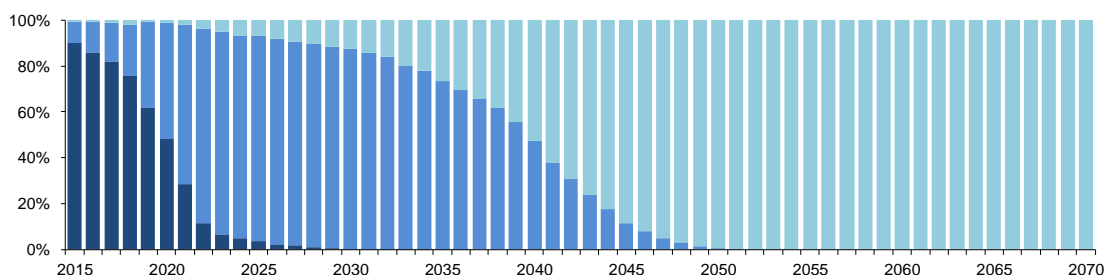
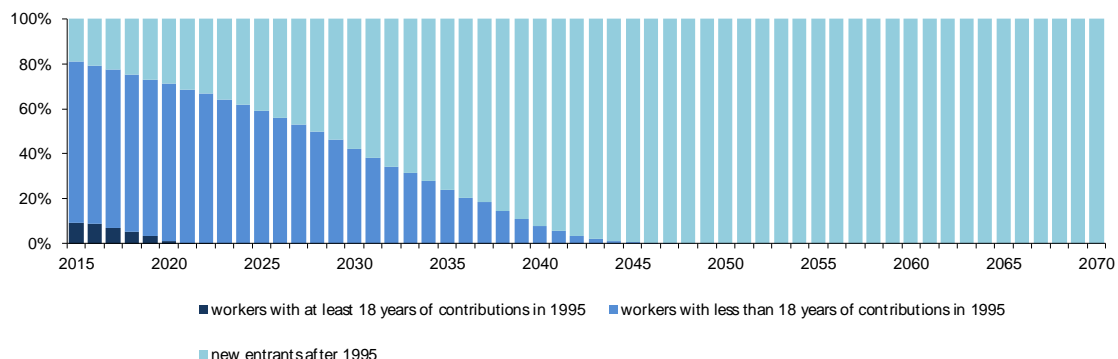


Figure 4.b: disability pensions



²⁷ In the current set of projections, labour productivity levels are higher than the corresponding values of the 2018 Ageing Report. In 2019, notified figures on labour productivity are 7 percentage points higher than the values forecasted by the 2018 Ageing Report exercise. Moreover, thanks to better prospects, over the medium term, the gap between the two labour productivity level increases and then stabilizes at the end of the projection period. Given the same underlying assumptions, over the long term, the two set of projections show almost similar growth rates. The evolution of the average pension, instead, shows similar patterns between the two projection exercises. Only in the last part of the projection horizon the average pension estimated in the current round is significantly higher than the corresponding level of the 2018 Ageing Report. This apparent inconsistency is due to the fact that accrued contributions are valorized in line with the previous 5 years moving average of nominal GDP growth. So higher GDP rates translate into higher pensions only with a significant lag. Overall, it takes around 20-30 years for higher productivity/GDP levels to be translated in full into higher average pensions.

3.2 Net pension expenditure

Pension expenditure net of the taxation on pensioners' income, reported in Table 6, has been projected following the same rule adopted in the previous round. Accordingly, tax revenues as a share of pension expenditure are, in a simplistic fashion, assumed to be constant over time so as to assure cross-country comparability. Similarly to the results of the 2018 Ageing Report, the difference between the gross and the net pension-to-GDP ratio which proxies the tax revenues on public pensions is projected to move from 2.9% of GDP in the base year to 3.4% around 2040 and then settle on 2.6% towards the end of the forecasting period.

3.3 Pension expenditure by scheme

Table 7 shows that old-age and early pensions, which includes also disability pensions for people with age above the SRA, represent the lion's share of pension expenditure. In terms of total pension expenditure, its incidence goes from 81.9% in 2019 to 85.8% in 2070. In the same period, the weight of survivors' pensions²⁸ declines from 15.7% to 12.2%, while the quota of disability pensions, below the SRA, decreases from 2.4% to 2.1%.

The expenditure for social pensions and old-age allowances is projected to increase in terms of GDP, moving from 0.3% in 2019 to 0.4% in 2070. This trend is driven by both the number of beneficiaries and the average amount of pension. The former mainly depends on the ageing population and the decreasing quota of the elderly with only survivor's pension entitlements; the latter is due to the more favourable indexation rule assumed under the constant policy scenario (§.1.3).

The pension expenditure projections include the special pensions' categories with reference, in particular, to armed forces and workers in difficult conditions. The total expenditure on special pensions in 2019 has been 1.0% of GDP. In the projections all the special pension categories are aggregated for the sake of computation.

²⁸ One additional factor explaining the projected evolution of survival pensions as a ratio of GDP is also due to the biannual revision of the transformation coefficients. The most recent update, entering into force in 2021 and which has been legislated with the Ministerial Decree of June 2020 published on the Official Journal n.147 of 11 June 2020, revised also the following parameters affecting the calculation of survival pensions: 1) the probability of death and the probability by sex and age of death and new marriage for the survival spouse; 2) the probability to leave a family by sex and age; 3) the age gap between partners by sex and age of the deceased.

Table 7 - Projected gross public pension spending by scheme (% of GDP)

Pension scheme	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-2070
Total public pensions	15,4	17,3	17,8	16,2	14,1	13,6	18,0	2036	-1,8
Old-age and early pensions	12,6	14,5	15,0	13,6	11,8	11,7	15,0	2036	-1,0
<i>Flat component</i>									
<i>Earnings-related</i>	12,3	14,2	14,6	13,2	11,4	11,3	14,7	2036	-1,0
<i>Minimum pensions (non-contributory) i.e. minimum income guarantee for people above 65</i>	0,3	0,3	0,4	0,4	0,4	0,4	0,4	2051	0,1
Disability pensions	0,4	0,4	0,3	0,3	0,3	0,3	0,4	2020	-0,1
Survivors' pensions	2,4	2,5	2,6	2,4	2,0	1,7	2,7	2020	-0,8
Other pensions									
Special pension schemes	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-2070
Difficult Conditions	0,3								
Security and Defence	0,7								
...									

Source: Commission Services and Member State.

3.4 Main driving forces behind pension projections

3.4.1 Benefit ratio and economic dependency ratio

The decomposition of pension expenditures as a ratio of GDP, reported in table 8, not surprisingly shows that the demographic transition and the expected increase in life expectancy will exert a strong negative impact of pension/GDP projections. Such an effect (measured by the dependency ratio) accounts for 9.5 p.p. over the entire forecasting period, though it is in the period 2020-2040, in coincidence with the retirement of the baby boom generations, that the dependency ratio increases the most.

In the long run, the deterioration of the sustainability of the pension system driven by the adverse demographic perspectives is not expected to take place thanks to the offsetting effects triggered by past pension reforms, in spite of the increase of pension outlays produced by the new temporary measures adopted in 2018-2019.

Indeed, the evolution of the benefit ratio is expected to provide a decreasing contribution on pension expenditures as a ratio of GDP amounting to -4.3 p.p. mostly imputable to the progressive phasing in of the NDC scheme and the indexation of pension to price inflation. Similarly, the evolution of the coverage ratio is expected to reduce pension expenditures as a ratio of GDP by -3.5 p.p. in the period 2019-2070, due to the increase in the eligibility requirements and their linkage to changes in life

expectancy. Finally, the effect due to employment ratio equal to -2.9 p.p. is mainly boosted by the postponement of the retirement age.

The decomposition of the pension expenditure as a ratio of GDP given by the product of the 'benefit ratio' (the ratio of average pension to labour productivity) with the 'economic dependency ratio' (the ratio of pensions to employees) presented in figure 3.b and 3.c provides more in-depth and valuable information on the driving forces behind the new baseline pension projections vis-à-vis the results of the 2018 Ageing Report.

In the new baseline scenario, as a consequence of the easier access to early retirement due to the introduction of Quota 100 requirements, the number of pensions increases substantially over the period 2019-2026 somehow compensating for the expected growth of the number of employees. Thereafter, over the following two decades, the ratio of pensions to employees rises steeply, as the baby boom generations are expected to move from the working age (denominator) to the old-age classes (numerator), while the employment rate stops increasing. In the last part of the forecasting period, the economic dependency ratio first stabilizes and then declines because of the exit of the baby boom generations.

The benefit ratio, leaving aside the positive blip of 2020 due to the fall in GDP levels, increases steadily up to 2031. In this period, in fact, workers retiring on the basis of the requirements of Quota 100 initially enjoy relatively higher pension benefits thanks to the earnings related and mixed schemes, whereas the increasing quota of pensions calculated according to the NDC method does not compensate for the productivity growth projected on the basis of the macroeconomic assumptions. In the subsequent period, however, when the productivity growth approaches its structural level, the benefit ratio decreases significantly because of the phased-in process of the NDC scheme.

Table 8 - Factors behind the change in public pension expenditures between 2019 and 2070 (in percentage points of GDP) - Pensioners

	2019-30	2030-40	2040-50	2050-60	2060-70	2019-2070
Public pensions to GDP	1,9	0,5	-1,6	-2,1	-0,6	-1,8
Dependency ratio effect	3,7	4,6	1,5	-0,2	0,0	9,5
Coverage ratio effect*	-1,5	-1,0	-0,2	-0,3	-0,5	-3,5
<i>Coverage ratio old-age</i>	-0,8	-0,2	0,1	-0,3	-0,5	-1,7
<i>Coverage ratio early-age</i>	-4,2	-4,2	-3,4	-1,7	-1,2	-14,5
<i>Cohort effect</i>	-2,1	-5,5	-1,5	1,0	-0,2	-8,4
Benefit ratio effect	1,2	-1,9	-2,5	-1,4	0,2	-4,3
Labour market effect	-1,3	-0,8	-0,3	-0,2	-0,3	-2,9
<i>Employment ratio effect</i>	-0,7	-0,5	-0,3	0,0	-0,1	-1,6
<i>Labour intensity effect</i>	0,0	0,0	0,0	0,0	0,0	0,0
<i>Career shift effect</i>	-0,6	-0,4	0,0	-0,2	-0,2	-1,4
<i>Residual</i>	-0,2	-0,3	-0,1	0,0	0,0	-0,6

* Subcomponents of the coverage ratio effect do not add up necessarily.

3.4.2 Average replacement rates

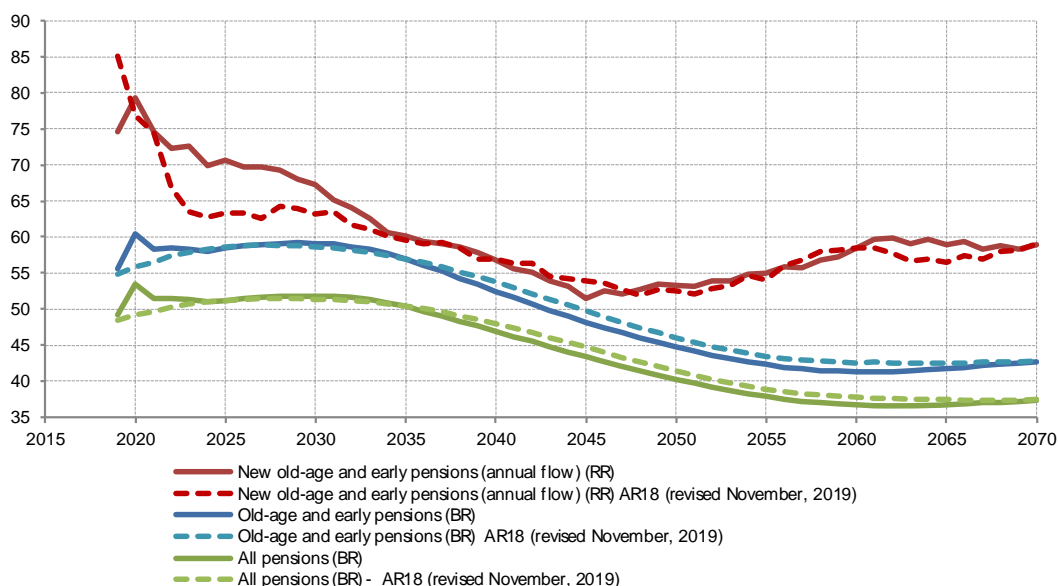
As noted above, the reduction in the benefit ratio is mainly due to normative reasons. Beside the indexation of pensions to price inflation alone, an important role is played by the gradual shift from the DB to the NDC scheme, reinforced by the periodic revision of transformation coefficients in accordance with mortality assumptions.

In this regard, Table 9 shows the evolution of the replacement rate, i.e. the ratio between the average pension (new old-age and early pensions), and the gross average wage/labour income at retirement. In the baseline scenario, during the years 2019-2021 and with the Quota 100 regime still in force, this indicator floats at relatively high levels averaging the value of 65%. This pattern is due to the retirement of workers with DB and mixed regime who obtain relatively higher pension benefits. Subsequently, the replacement rate starts declining. With the gradual consolidation of the NDC calculation method, flanked by a recovery in productivity growth, the ratio decreases, settling on its minimum of about 45% around 2050 and then increases again up to close to 51% at the end of the forecasting period. It is interesting to note that, during the transitional phase, the indexation of pension to price inflation reduces the gap between the older pensions, calculated with the more generous DB rules, and the new ones which are correlated with current earnings (Fig. 5).

Table 9 - Replacement rate at retirement (RR), benefit ratio (BR) and coverage by pension scheme old-age earnings related (in %)

	2019	2030	2040	2050	2060	2070	change 2019-2070
Public scheme (BR)	61%	64%	57%	49%	45%	46%	-15,2%
Coverage	100	100	100	100	100	100	0
Public scheme old-age earnings related (BR)	62%	67%	59%	50%	46%	47%	-14,7%
Public scheme old-age earnings related (RR)	67%	55%	46%	45%	49%	51%	-15,4%
Coverage	78,8	78,2	79,3	80,2	79,6	80,3	1,49
Private occupational scheme (BR)							
Private occupational scheme (RR)							
Coverage							
Private individual scheme (BR)							
Private individual scheme (RR)							
Coverage							
Total (BR)	61%	64%	57%	49%	45%	46%	-15,2%
Total (RR)	67%	55%	46%	45%	49%	51%	-15,4%

Figure 5: benefit ratio and replacement rate expressed in terms of economy wide average wage



3.4.3 Old-age and system dependency ratios

The Old-age Dependency Ratio (ODR) compares the elderly above a given age threshold (generally 65 years), supposed economically dependent, with the working age population (generally 20-64 years), supposed economically active. However, such a decomposition does not correspond to an economic concept of dependency. In fact, an elderly person might be still active and contributing to the pension system, while an adult might be inactive and receiving pension benefits. Moreover, the age thresholds which separate dependent people (elderly and young) from the working age population are not clearly defined and may vary over time in relation to possible

changes in individual behaviours and legislative frameworks regulating pension and education systems.

Such aspects may be better reflected by the economic dependency ratio, defined as the ratio between pensioners and employees, regardless of age. This indicator, labelled as 'Pension System Dependency Ratio (SDR)' in Table 10, emphasizes the contribution brought about by changes in the legal framework of the pension system.

The ratio between the SDR and ODR provides a measure of the 'System Efficiency'. As shown in table 10, such an indicator undergoes a large reduction over the forecasting period, from 1.6 in 2019 to 1.1 in 2070 still signaling the effectiveness of the pension reform process described in chapter 1.

Figures 3.d-3.f provide more information about the evolution of pensions to employees ratio (economic dependency ratio), which is projected to increase significantly less than the elderly dependency ratio. Apart from the counteracting effect brought about by the increase in the employment rate (Figure 3.e), the more contained dynamics of the economic dependency ratio mainly depend on the incidence of pensions to the population 70+, which is projected to decline considerably over time (Figure 3.d). The reason for that is to be found in the evolution of survivors' pensions entitled to the over 70 and the earnings-related pensions paid to the under 70.

As for the former, it should be noted that changes in life expectancy, while significantly affecting the number of the elderly, are more or less neutral to the evolution of survivors' pensions. In fact, higher life expectancy does not increase, for the widow or widower, the average period of outliving their spouse.

As for the latter, it is worth mentioning that the incidence of pensions to people under 70, expressed in terms of the elderly (70+), will be reduced not only for the increase in the eligibility requirements, but also, and to a large extent, for a simple composition effect due to changes in the demographic structure. In fact, the quota of population in the age bracket 50-69 (where the relevant part of pensions under 70 is placed) on that of people 70+ is projected to fall relevantly. This means that the number of pensions under 70 would be reduced even if the take-up ratio were constant.

Table 10 - System Dependency Ratio and Old-age Dependency Ratio

	2019	2030	2040	2050	2060	2070	change 2019-2070
Number of pensioners (I) ('000)	14.796	15.900	17.504	17.747	16.605	15.415	619,0
Employment (II) ('000)	23.376	24.168	23.185	22.289	21.878	21.435	-1940,5
Pension System Dependency Ratio (SDR) (I)/(II)	63,3	65,8	75,5	79,6	75,9	71,9	8,6
Number of people aged 65+ (III) ('000)	13.866	16.360	19.095	19.559	18.664	17.965	4099,6
Working age population 20-64 (IV) ('000)	35.660	34.053	31.117	29.402	28.495	27.375	-8284,9
Old-age Dependency Ratio (ODR) (III)/(IV)	38,9	48,0	61,4	66,5	65,5	65,6	26,7
System efficiency (SDR/ODR)	1,6	1,4	1,2	1,2	1,2	1,1	-0,5

Source: Commission Services.

3.4.4 Pensioners and elderly population

Tables 11.b and 12.b report the incidence of pensioners in terms of population in total and for women. In 2019, the ratio of pensioners aged 60-64 with respect to the corresponding population is around 34.5%. It has to be noted that, in line with the introduction of the new early retirement channel of Quota 100, the number of pensioners aged 60-64 expressed as a ratio of the corresponding population increases between 2019 and 2021 with respect to the value of 2018, on average, by 0.5%. In 2030, the ratio of pensioners to population aged 60-64 will still be around 21.6%. One of the consequence of such resilience is due to the 6 months reduction in the minimum contribution requirement for the early retirement based only on accrued contributions resulting from the freezing of the periodical updates in life expectancy for the period 2019-2026.

Besides the considerations on the expected impact of recently adopted pension measures on specific age groups in the projection horizon, the percentage of the retired tends to shrink over time for all the age brackets given the remarkable increase in the eligibility requirements, especially from 60 to 69. Instead, such a reduction is much lower in the age bracket 70-74 where changes in the eligibility requirements are limited and will materialise only towards the end of the forecasting period.

Looking at the elderly above 70, the incidence of pensioners is slightly decreasing. This trend is mainly due to the presence of non-resident pensioners in the base year. In fact, the definition of population underlying the demographic projections refers to resident persons, while pensions are also paid to the non-resident.

The same conclusions may be drawn from the analysis of the incidence of pensioners in terms of inactive population, reported in table 11.a and 12.a.

Table 11.a - Pensioners (public schemes) to inactive population ratio by age group (%)

	2019	2030	2040	2050	2060	2070
Total						
- Age group -54	2,3	2,1	1,8	1,8	1,6	1,4
- Age group 55-59	27,6	27,0	24,5	24,1	22,9	22,3
- Age group 60-64	61,3	59,1	46,5	35,5	33,9	31,2
- Age group 65-69	90,3	88,6	85,6	83,4	73,1	62,7
- Age group 70-74	95,7	94,5	97,2	95,0	99,0	96,1
- Age group 75+	98,0	99,0	97,6	97,4	97,6	98,3

Table 11.b - Pensioners (public schemes) to population ratio by age group (%)

	2019	2030	2040	2050	2060	2070
Total						
- Age group -54	1,0	1,0	0,8	0,8	0,7	0,7
- Age group 55-59	8,5	6,6	5,9	5,7	5,3	4,9
- Age group 60-64	34,5	21,6	14,5	10,5	9,5	8,1
- Age group 65-69	77,8	61,9	55,3	48,5	38,1	30,2
- Age group 70-74	91,8	89,8	91,0	87,8	88,6	83,9
- Age group 75+	98,0	99,0	97,6	97,4	97,6	98,3

Table 12.a - Female pensioners (public schemes) to inactive population ratio by age group (%)

	2019	2030	2040	2050	2060	2070
Total						
- Age group -54	2,5	2,3	1,8	1,6	1,5	1,3
- Age group 55-59	17,5	21,6	20,3	19,5	18,0	16,4
- Age group 60-64	42,9	41,4	35,6	28,3	28,1	24,5
- Age group 65-69	77,1	71,6	71,2	65,0	56,6	50,7
- Age group 70-74	86,7	84,7	90,1	88,9	89,9	87,0
- Age group 75+	95,3	95,3	94,9	95,3	96,7	97,1

Table 12.b - Female pensioners (public schemes) to population ratio by age group (%)

	2019	2030	2040	2050	2060	2070
Total						
- Age group -54	1,3	1,2	0,9	0,9	0,8	0,7
- Age group 55-59	7,5	7,0	6,3	5,8	5,3	4,7
- Age group 60-64	27,8	17,7	12,8	9,8	9,1	7,5
- Age group 65-69	69,8	52,3	47,4	39,4	30,9	25,6
- Age group 70-74	85,1	81,1	84,3	81,5	80,3	75,8
- Age group 75+	95,3	95,3	94,9	95,3	96,7	97,1

3.5 New public pension expenditure

Tables 13.a-13.c illustrate, in total and for both genders, the projected expenditure for new pensions and its decomposition in terms of number of pensions and their average amount. In turn, the latter has been broken down into three factors: the

average contribution period, the average pensionable earnings, and the average accrual rate.

Over the short term (2019-2021), the evolution of the number of new pensions clearly reflects the impact of the introduction of the new early retirement regime Quota 100, whereas over the medium term it describes the transition of the baby boom generations into retirement age. From an average annual level of about 522,000 over the first decade of the forecasting period, the number of new pensions increases to a level close to 675,000 in the middle of the forecasting period (2030-2039), and declines afterwards to about 535,000 units toward the last decade. Gender composition shows that new male pensions account, on average, for about 57% of the total.

The average accrual rate is a weighted mean of the accrual rate explicitly foreseen in the DB calculation method (2%) and that implicit in the NDC scheme, defined as the product of the contribution rate times the transformation coefficient at the age of retirement. The former is constant, while the latter changes according to the contribution rate, the age of retirement and the periodic revision of transformation coefficients. The average accrual rate moves from 1.90%, characterized by the prevalence of pensions calculated on the basis of the DB method, to 1.70% around 2035, when the NDC method is largely predominant, and then to 1.65% at the end of the forecasting period. The last figure may be obtained by simply multiplying the average contribution rate (about 31%) by the transformation coefficient corresponding to the average retirement age, about 5.3% (Figure 6).

Gender analysis highlights that the average accrual rate of females is a little higher than that of males by about 0.1 percentage points. This reflects the fact that women will retire somewhat later than men under the NDC scheme as it is less probable for them to access early retirement due to generally lower contributions/pension rights. It also depends on the privilege of an augmented transformation coefficients granted to women in relation to the number of children.

Figure 6 illustrates how and to what extent the indexation of the eligibility requirement to changes in life expectancy is able to compensate for the downward effects due to the revision of the transformation coefficients. It is not difficult to ascertain that the introduction, on a temporary basis, of a new avenue for early retirement does not affect overall adequacy/stability of the Italian pension system.

The average contribution period per pension increases by about 1.9 years from the 2019 level reaching in 2070 a level of 38.1 (Figure 7) with a spike in 2019, corresponding to people retiring with Quota 100 regime who have a relatively richer contribution tenure.

Overall, the increase in the average contribution period per pensions accounts for about 35% of the corresponding increase in the average retirement age. The difference

is mainly explained by the postponement of the entry age in the labour market observed for younger generations.

The overall increase in the average contribution period is basically concentrated in the last part of the forecasting period. The initial rise, up to 2020, is due to the elevation of the retirement age, mainly driven by the alignment process of the SRA of women in the private sector to that of the other workers as well as from the retirement of workers with Quota 100 criteria who have accrued a relatively high amount of contributions (at least 38 years).

Instead, in the central part of the forecasting period, the average contribution period remains almost stable, despite the indexation of the eligibility requirements. This outcome has two basic explanations. Firstly, the cohorts retiring in this period started contributing to the pension system somewhat later compared to their predecessors, as it emerges from the database of the insured. Secondly, early retirement foreseen under the NDC scheme becomes gradually effective as of around 2030 and thus contributes to slowing down the increase in the average retirement age.

Both explanations also clarify gender differences in the contribution records. In fact, women face a much lower probability compared to men to access early retirement under the NDC scheme, due to well-known gender gaps in wages and careers²⁹. On top of that, the average entry age into the labour market of women is somewhat higher than that of men as is also the risk of career gaps linked to maternity and disabled and elderly caregiving.

The average contribution period per pensioner follows the same path as that of pensions, though it is a couple of years higher, since supplementary, additional pensions are generally of a very small amount.

The average pensionable earnings should be actually interpreted as a weighted average between the explicit reference wage under the DB method and an implicit reference wage under the NDC one³⁰. As expected, average pensionable earnings, if deflated with productivity growth, decline in the long run according to the gradual shift towards the NDC calculation rules. In terms of the average gross wage (national accounts figures), it goes from around 98.8% of 2019 to 100% in 2030 ending up to 84.3% in 2070.

²⁹ In addition, a substantial minimum amount of pension is required (1,200 euro in 2012 indexed with the five-year mobile average of nominal GDP).

³⁰ With regard to the former, the number of last annual wages involved in the calculation of the reference wage mainly depends on sector, contribution period and retirement age. As for the latter, the implicit reference wage is defined as an average of lifelong wages indexed with GDP growth (§. 1.1.1).

Table 13.a - Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - Total

	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-2070
Projected new pension expenditure (millions EUR)	106	177	214	211	357	494	494	2070	388
I. Number of new pensions ('000)	469,2	706,4	729,9	531,7	568,2	545,8	744,0	2032	76,6
II. Average contributory period	36,2	35,2	35,3	35,1	36,6	38,1	38,1	2070	1,9
III. Average accrual rates	1,90	1,72	1,69	1,68	1,69	1,65	1,94	2018	-0,25
IV. Monthly average pensionable earnings ('000 EUR)	2.517	3.188	3.785	5.165	7.805	11.045	11.045	2070	8.528
V. Sustainability/Adjustment factor	:	:	:	:	:	:			
VI. Average number of months paid the first year	13,0	13,0	13,0	13,0	13,0	13,0			
Monthly average pensionable earnings/Monthly economy-wide average wage	98,8%	100,4%	85,6%	80,8%	84,9%	84,3%		2070	-14,5%

Source: Commission Services.

Table 13.b - Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - Male

	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-2070
Projected new pension expenditure (millions EUR)	77	112	131	127	220	295	295	2070	218
I. Number of new pensions ('000)	328,0	392,8	401,2	297,1	324,8	310,0	410,0	2032	-18,0
II. Average contributory period	36,8	36,4	36,3	35,7	37,0	38,3	38,6	2063	1,5
III. Average accrual rates	1,90	1,68	1,64	1,64	1,65	1,61	1,94	2018	-0,29
IV. Monthly average pensionable earnings ('000 EUR)	2.569	3.586	4.200	5.640	8.514	11.848	11.848	2070	9.279
V. Sustainability/Adjustment factor	:	:	:	:	:	:			
VI. Average number of months paid the first year	13,0	13,0	13,0	13,0	13,0	13,0			
Monthly average pensionable earnings/Monthly economy-wide average wage	100,8%	112,9%	95,0%	88,2%	92,6%	90,4%		2070	-10,4%

Source: Commission Services.

Table 13.c - Projected and disaggregated new public pension expenditure (old-age and early earnings-related pensions) - Female

	2019	2030	2040	2050	2060	2070	Peak value	Peak year	change 2019-2070
Projected new pension expenditure (millions EUR)	29	66	83	83	137	199	199	2070	170
I. Number of new pensions ('000)	141,2	313,6	328,8	234,6	243,4	235,8	334,0	2032	94,6
II. Average contributory period	35,0	33,8	34,0	34,3	36,1	37,8	37,8	2070	2,8
III. Average accrual rates	1,90	1,77	1,75	1,75	1,75	1,72	1,96	2018	-0,17
IV. Monthly average pensionable earnings ('000 EUR)	2.395	2.689	3.279	4.564	6.860	9.989	9.989	2070	7.594
V. Sustainability/Adjustment factor	:	:	:	:	:	:			
VI. Average number of months paid the first year	13,0	13,0	13,0	13,0	13,0	13,0			
Monthly average pensionable earnings/Monthly economy-wide average wage	94,0%	84,7%	74,2%	71,4%	74,6%	76,2%		2070	-17,8%

Source: Commission Services.

Figure 6: update of transformation coefficients and mean value at the average retirement age

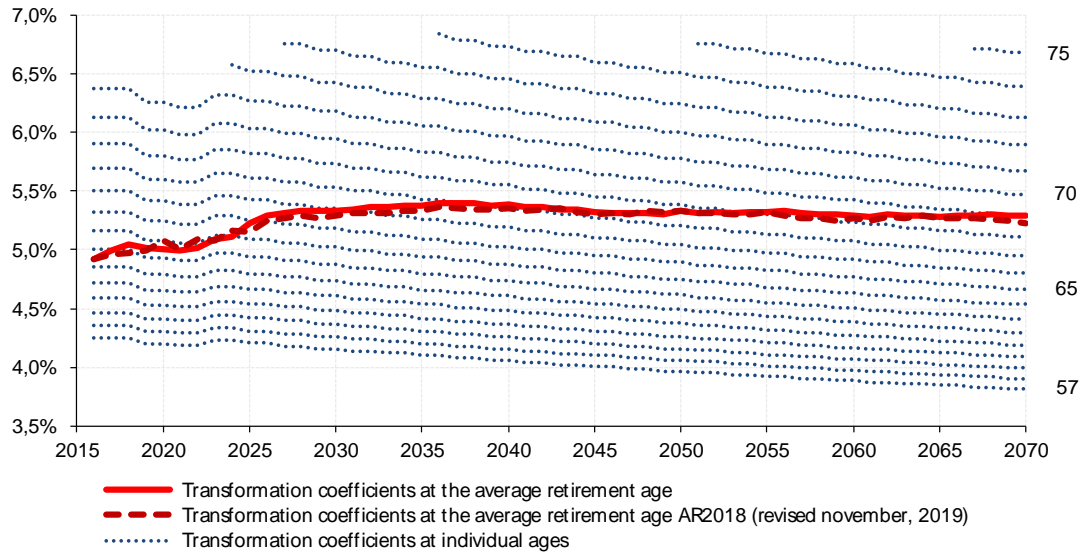
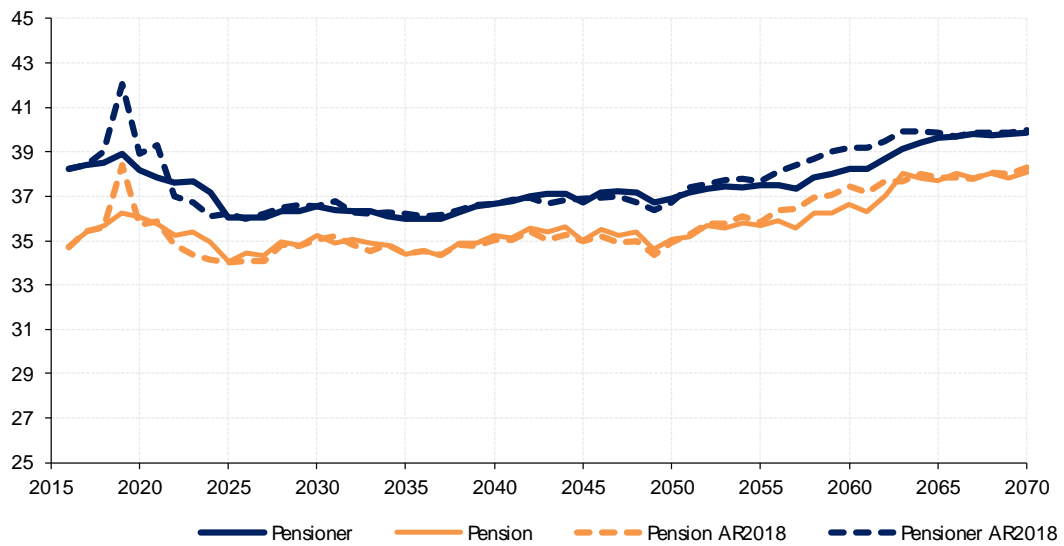


Figure 7: average contribution period



3.6 Financing of the pension system

Contributors evolve substantially in line with employment over the whole forecasting period, allowing for minor adjustments by sector. At the same time, the average labour income subject to contribution (contribution base divided by the number of contributors) is assumed to grow in line with productivity, according to the general

rule agreed in the WGA for the mid-long term. As a consequence, the overall contribution base evolves in line with GDP growth. Therefore, the total pension contributions remain basically constant as a share of GDP, except for a slight increase over the initial projection years due to the gradual elevation of the contribution rates foreseen for the self-employed and atypical workers. Starting from the level of 10.7% in 2019, the contributions to GDP ratio slightly increases up to 11% in 2030 and remains overall constant afterwards. (Tables 14-15).

Table 14 - Financing of the system

	Public employees	Private employees	Self-employed
Contribution base	112.267	363.198	143.424
Public pension contributions (%GDP)	33,0%	33,0%	24,0%
<i>Employer contributions</i>	23,8%	23,8%	
<i>Employee contributions</i>	9,2%	9,2%	24,0%
<i>State contribution</i>			
<i>Other revenues</i>			
Maximum contribution ⁽¹⁾⁽²⁾	33.839	33.839	24.610
Minimum contribution ⁽²⁾	3.521	3.521	3.825

(1) Estimates based on maximum and minimum contribution base.

(2) Values only refer to the new entrants after 1995.

Table 15 - Revenue from contribution (million), number of contributors in the public scheme (in 1000), total employment (in 1000) and related ratios (%)

	2019	2030	2040	2050	2060	2070	change 2019-2070
Public pension contributions (%GDP)	10,7	11,0	11,0	11,1	11,1	11,0	0,2
<i>Employer contributions</i>	8,0	8,2	8,2	8,3	8,3	8,2	0,2
<i>Employee contributions</i>	2,7	2,8	2,8	2,8	2,8	2,8	0,1
<i>State contribution*</i>							
<i>Other revenues*</i>							
Number of contributors (I) (1000)	23.823	24.430	23.369	22.604	22.293	21.566	-2.257
Employment (II) (1000)	23.376	24.168	23.185	22.289	21.878	21.435	-1940,5
(I) / (II)	1,0	1,0	1,0	1,0	1,0	1,0	0,0

Source: Commission Services.

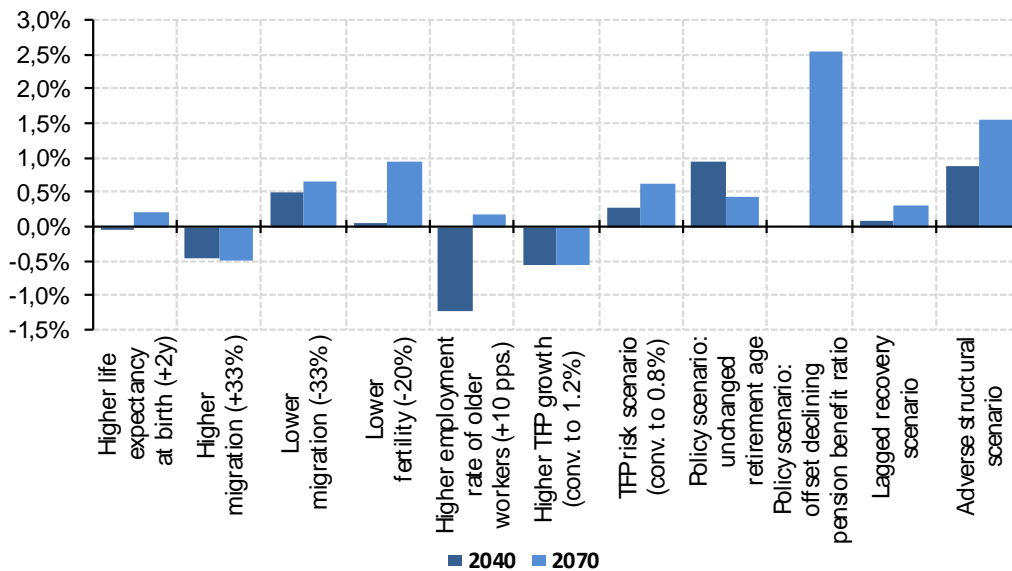
* only legislated contributions are reported

3.7 Sensitivity analyses

Table 16 reports the deviations in the projection of pension expenditure to GDP brought about by the sensitivity tests agreed in the WGA. Figure 8 also compares the deviations in public debt as a share of GDP in 2040 and at the end of the forecasting period.

Since the current legislation already foresees a linkage between the eligibility requirements and changes in life expectancy (§. 1.1.2), the sensitivity test on such a 'policy scenario' is of no relevance in this setting.

Figure 8: pension expenditure as percentage of GDP, year 2040 and 2070 - Comparison with the baseline scenario



Life expectancy: *2-year increase gradually achieved over the whole forecasting period.*

Assuming a 2-year increase in life expectancy, the old-age dependency ratio (people of 65+ to working-age population 20-64) settles at an increasingly higher level. At the end of the forecasting period, it is about 4.5 percentage points higher (65.6% vs 70.1%) than in the baseline. In fact, while the denominator (working-age population) tends to remain almost unchanged, the numerator strongly reflects differences in life expectancies. However, the impact of the increasing deviation in the old-age dependency ratio is counterbalanced by the containing effects on the number of

pensioners stemming from the eligibility requirements indexation and on the average amount of pension resulting from the revision of transformation coefficients. In turn, the counteracting effects of the automatic adjustment to changes in life expectancy overcome those brought about by demographic changes, until around 2040. Thereafter, the ratio of pension expenditure to GDP tends to increase a little more rapidly than under the baseline assumptions until it settles at 0.2 percentage points above in the last 20 years of the forecasting period.

In order to explain the size and the time profile of deviations from the baseline, it is useful to recall that an increase in life expectancy, and then in the retirement age, produces a reduction in the number of new pensioners. Correspondently, the same change in life expectancy implies lower mortality rates for all ages (especially among the very elderly), which gradually raises the number of total pensioners. This gradually compensates for the financial effect caused by the reduction of new pensioners. As expected, the transition of the baby boom generations into retirement emphasizes the saving effects in the central part of the forecasting period, as they retire, and the compensating effects in the last part, as they get older.

Migration: *33% increase/decrease of net flows of immigrants.*

An increase in migration flows implies a reduction in pension expenditure to GDP ratio. Compared to the baseline scenario, the maximum difference of 0.7 percentage points is reached around 2050. Afterwards, it tends to shrink towards 2070, where it accounts for about 0.5 percentage points. Such a result is explained by higher GDP growth rates, due to increased numbers of employees. In particular, the decrease in the old-age dependency ratio is translated into the ratio of pensions to employees. The difference tends to stabilize as soon as the additional immigrants grow old and, consequently, retire. A further containing effect on pension expenditure stems from higher replacement rates, which results from the more favourable capitalization rates, linked to GDP growth, under the NDC regime.

Projection results are somewhat symmetrical in case of an equivalent decrease of the net flows of immigrants.

Fertility rate: *20% decrease of fertility rate gradually achieved over the whole forecasting period.*

Any change in the fertility rate starts to turn into employment after some 20 years and it takes further 40–50 years to affect the number of pensioners. This means that no direct effect is produced on pension expenditure within the horizon of the forecasting period, apart from that coming from disability pensions (actually negligible) and, to some extent, poorer replacement rates due to lower capitalization rates under the NDC system.

Therefore, a 20% reduction in the fertility rate would gradually increase the projected ratio of pension expenditure to GDP starting from around 2035. The deviation accounts for 0.4 in 2050, 0.7 in 2060 and settles on 1.0 pp at the end of the forecasting horizon. As expected, such an outcome is mostly explained by a corresponding decrease in the number of employees and GDP level, partially compensated for by lower pension amounts towards the end of the forecasting period.

Older workers' participation rate: *10% increase of employment rates in the age bracket 55-74 as of 2030, gradually achieved from 2019.*

Prolonging working lives further with respect to what is already assumed in the baseline scenario has been achieved through two assumptions: zeroing the probabilities of early retirement and increasing the propensity of working after reaching the SRA.

The reduction in pension expenditure to GDP ratio reaches its maximum value of about 1.8 percentage points around 2030. Such an outcome mainly reflects changes in employment (and GDP growth) and in the number of pensions during the first decades of the forecasting period. Moving towards 2070, these effects tend to be offset by an increase in the average pension due to longer working careers and, under the NDC system, higher transformation coefficients and capitalization rates. In the last decade of the forecasting period, the latter effect overcomes, in terms of financial effects, the reduction in the ratio of pensioners to employees leading to an increase in pension expenditure of 0.2 percentage points vis-à-vis the baseline scenario.

Productivity: *0.2 pp higher TFP growth as of 2045, linearly achieved from 2029.*

Under the capital stock rule, a higher change in TFP growth of 0.2 pp, produces an increase in productivity and GDP growth of 0.3 pp. Consequently, the ratio of pension expenditure to GDP is lower/higher than that value vis-à-vis the baseline³¹. The deviation gradually increases until around 2060, where it accounts for -0.6 percentage points of GDP, remaining unchanged at the end of the projection period.

The differences in the ratio of pension expenditure to GDP are explained by the diverse evolution of the benefit ratios. Instead, the ratio of pensions to employees and its decomposition do not change significantly. This latter effect depends on the NDC method, which also requires a minimum amount of pension to access early and old-age retirement.

Risk scenario: *TFP growth rate converging to 0.8 in 2045.*

³¹ When pensions are indexed only to price inflation, as in the case of Italy, an increase (decrease) in the growth rate of productivity will result in an increase (decrease) in the growth rate of GDP of the same size. Diversely, pension expenditure is only marginally affected at the beginning. In fact, productivity growth only impacts on new pensions, which are related to earnings. Generally, it takes two to three decades until the structural change in the growth rate of productivity is entirely transferred to the pension expenditure evolution.

Such a scenario differs from the baseline only for the convergence level of TFP growth which settles in 2045 on 0.2 pp lower than the baseline. According to the capital formation rule agreed in the WGA, this implies a reduction in productivity growth of 0.3 pp. Therefore, the results are inverse and proportionally in line with those obtained with the sensitivity test on higher productivity growth.

Policy scenario: *unchanged retirement age.*

This scenario assumes that all the eligibility requirements for early and old-age pensions are kept unchanged over the whole projection horizon at the parameters in force for 2019.

In the case of unchanged retirement age, the pension expenditure-to-GDP ratio would increase quite significantly during the first twenty years of projections. Pension expenditure in relation to GDP would be, respectively, 1.1 percentage points and 0.9 percentage point higher than the baseline scenario in 2030 in 2040 as result of the significantly higher number of pensions. Thereafter, given the reduction of average pension benefits stemming from the lower accrued contribution deriving from the possibility of anticipate the retirement, pension expenditure would keep increasing with respect to the baseline but the change would be significantly lower (0.4 p.p. of GDP in 2070). More detailed results on this scenario are presented in figure 9.

Policy scenario: *offset declining pension benefit ratio*

This scenario assumes that policy measures are taken when the earnings-related public benefit ratio decreases by 10% relative to the base year. The scenario keeps the benefit ratio constant at this 10% lower point for the remainder of the projection period.

In order to prevent the decline in the benefit ratio below the 90% threshold, it was assumed to permanently increase pension indexation to prices starting from 2044 onwards. In this scenario, public pension expenditure increases steadily over the projection horizon. In 2070, the pension expenditure-to-GDP ratio is projected to rise by 2.6 percentage points of GDP compared to the baseline scenario. More detailed results on this scenario are presented in figure 10.

Lagged recovery scenario: the scenario assumes a relatively limited medium term impact of the recent COVID-19 crisis on potential growth with a lagged return on the baseline macroeconomic trends.

In this scenario a small upward impact on future pension expenditure is expected, considering that the late economic recovery and slower convergence to the values of the baseline scenario are assumed. Pension expenditure is expected to be higher than the baseline results by 0.1 percentage points of GDP until 2050 and by 0.3 percentage points of GDP afterwards.

Adverse structural scenario: this scenario assumes that, due to the crisis, the growth potential would be permanently lower than the baseline over the medium and the long-term as the crisis will structurally affect both the convergence unemployment rate (+ 30% higher) as well as the long term TFP growth anchor (30% lower than the baseline).

Considering such a permanent negative shock on the economic growth, pension expenditure is projected to increase gradually until reaching in 2070 a level which is up to 1.6 percentage points of GDP higher than the corresponding value in the reference scenario.

More detailed results on these Covid-19 crisis scenario are presented in figure 11. In particular, the upward increase in pension expenditure to GDP is driven by the higher ratio of average pension to productivity. Given the nature of the shock assumed in the adverse scenario, the downward change in GDP is immediately reflected in lower TFP and labour productivity, while it translates very slowly into a change in expenditure as the amount of accrued contribution used to calculate new pensions is capitalised with the nominal GDP growth rate (five-year geometric mobile average). As newly paid pensions are slowly stratified in the stock, it generally takes 20-30 years for the structural change in the rate of productivity growth to translate into a corresponding change in pension expenditure.

Figure 9: pension expenditures percentage of GDP and its decomposition - Unchanged retirement age compared to AWG 2021 Baseline projection

Figure 9.a: percentage ratio of expenditure to GDP

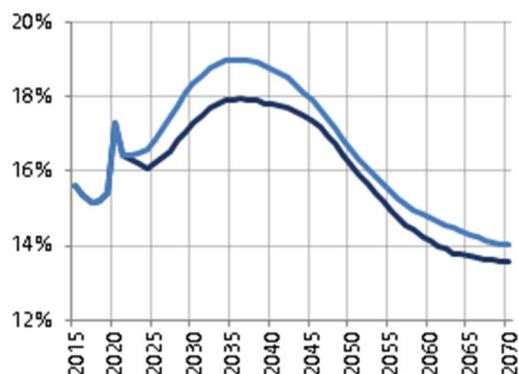


Figure 9.d: percentage ratio of pensions to people of 70+

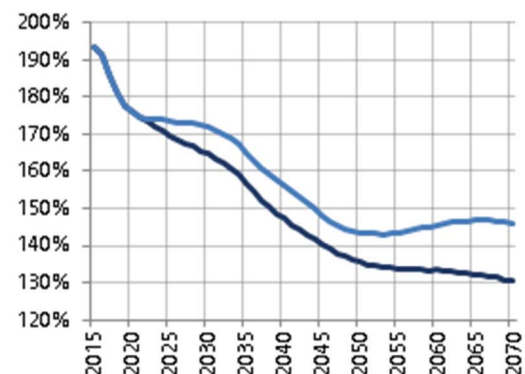


Figure 9.b: percentage ratio of average pension to productivity

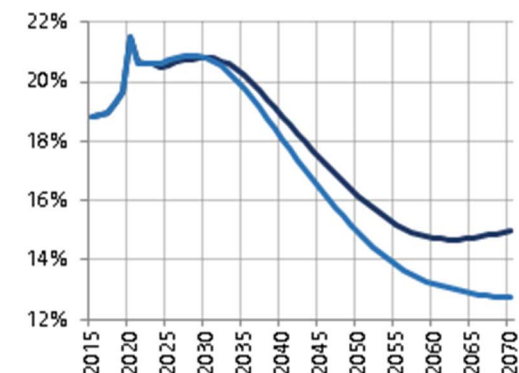


Figure 9.e: percentage ratio of employees to population [20-69]

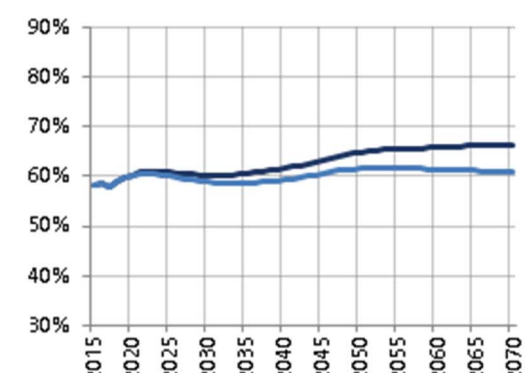


Figure 9.c: percentage ratio of pensions to employees

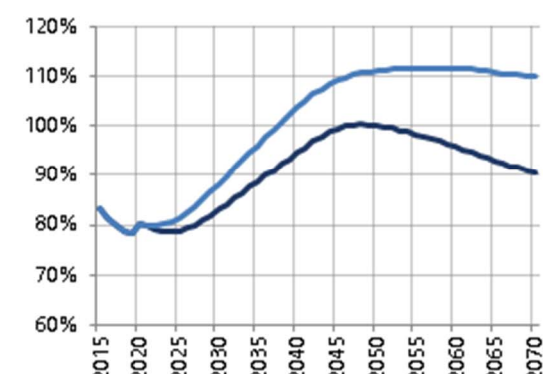
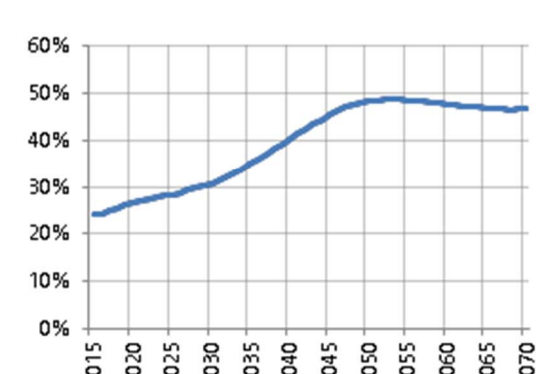


Figure 9.f: percentage ratio of people of 70+ to population [20-69]



— Baseline AR21 — Unchanged retirement age

Figure 11: pension expenditures percentage of GDP and its decomposition - Adverse structural scenario and lagged recovery scenario compared to AWG 2021 Baseline projection

Figure 11.a: percentage ratio of expenditure to GDP

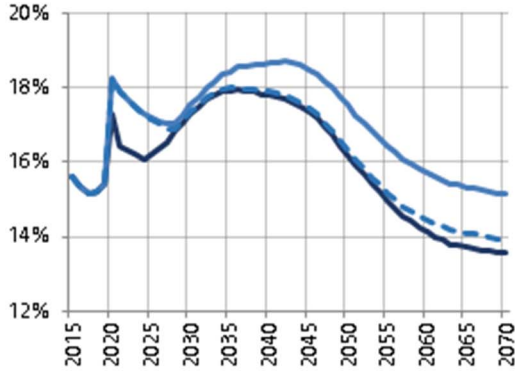


Figure 11.d: percentage ratio of pensions to people of 70+

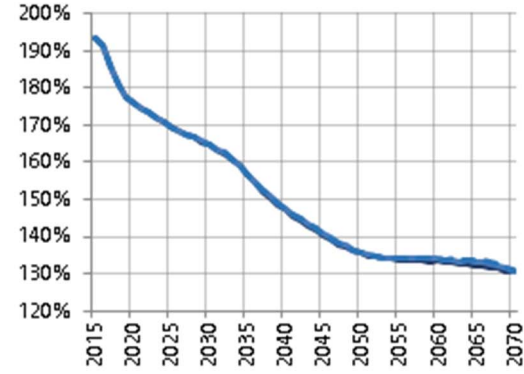


Figure 11.b: percentage ratio of average pension to productivity

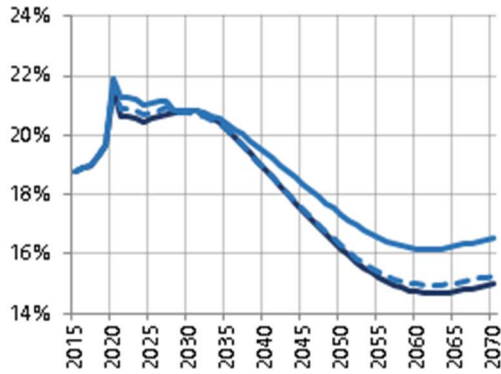


Figure 11.e: percentage ratio of employees to population [20-69]

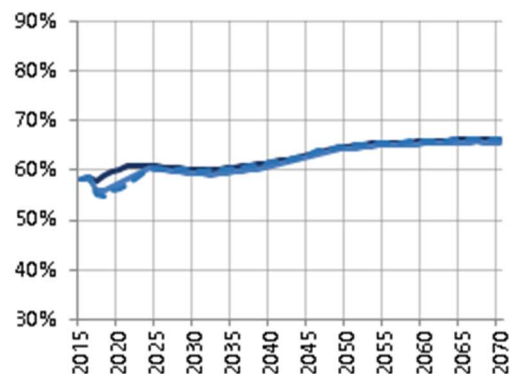


Figure 11.c: percentage ratio of pensions to employees

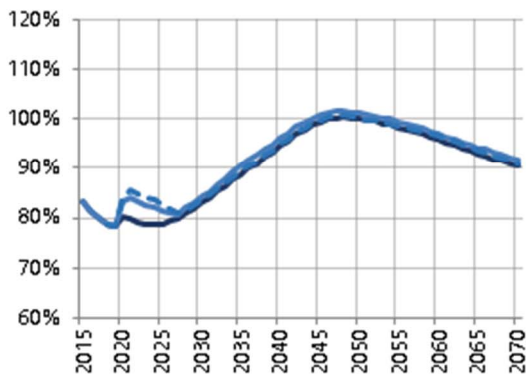
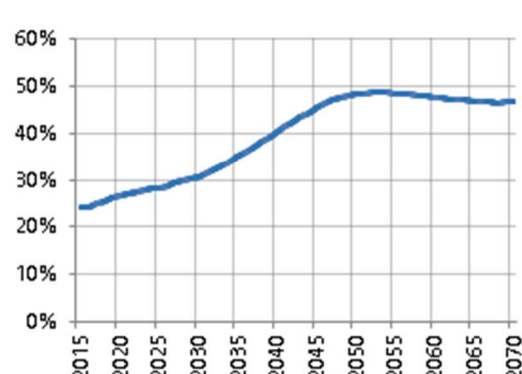


Figure 11.f: percentage ratio of people of 70+ to population [20-69]



— Baseline AR21 — Adverse structural scenario - - - Lagged recovery scenario

Public Pension Expenditure	2019	2030	2040	2050	2060	2070	change 2019-2070
Baseline (% GDP)	15,4	17,3	17,8	16,2	14,1	13,6	-1,8
Higher life expectancy at birth (+2y)	0,0	0,0	-0,1	0,2	0,2	0,2	0,2
Higher migration (+33%)	0,0	-0,2	-0,4	-0,6	-0,6	-0,5	-0,5
Lower migration (-33%)	0,0	0,2	0,5	0,7	0,8	0,7	0,7
Lower fertility (-20%)	0,0	0,0	0,1	0,4	0,7	1,0	1,0
Higher employment rate of older workers (+10 pps.)	0,0	-1,8	-1,2	0,0	0,3	0,2	0,2
Higher TFP growth (convergence to 1.2%)	0,0	-0,3	-0,6	-0,7	-0,6	-0,6	-0,6
TFP risk scenario (convergence to 0.8%)	0,0	-0,1	0,3	0,6	0,7	0,6	0,6
Policy scenario: unchanged retirement age	0,0	1,1	0,9	0,4	0,6	0,4	0,4
Policy scenario: offset declining pension benefit ratio	0,0	0,0	0,0	1,6	2,9	2,6	2,6
Lagged recovery scenario	0,0	0,1	0,1	0,1	0,3	0,3	0,3
Adverse structural scenario	0,0	0,2	0,9	1,3	1,6	1,6	1,6

3.8 Comparison with the previous WGA baseline projections

Table 17 compares pension results in the new baseline scenario with 2018 Ageing Report projections, decomposing the differences in the ratio of pension expenditures to GDP between the initial and final years of the forecasting horizon in the main underlying driving factors.

The change in pensions-to-GDP ratio between 2070 and 2019 of the new baseline scenario shows a reduction of 1.80 percentage points which is similar to that of previous projections as updated in November 2019. Instead, the contribution of the underlying factors presents some change. On the one hand, there is a reduction in the contribution of the dependency ratio that is compensated by the lower role exerted by the coverage ratios.

The differences between the new baseline scenario and the 2018 Ageing Report are mostly explained by changes in the underlying assumptions both over the historical period (Table 18.a) and over the projection horizon (Table 18.b). Over the historical period, the changes are mostly due to the higher notified GDP levels and by a lower number of pensions. Instead, over the projection horizon, the differences are explained mostly by the updated population projections as well as by the faster convergence to TFP growth anchor over the long term.

Table 17 - Average annual change in public pension expenditure to GDP during the projected period under the 2006, 2009, 2012, 2015, 2018 and 2021 projection exercises

	Public pension expenditure	Dependency ratio effect	Coverage ratio effect	Benefit ratio effect	Labour market effect	Residual (incl. interaction effect)
2006 Ageing Report (2004-2050)	0,41	11,54	-3,17	-5,29	-1,99	-0,69
2009 Ageing Report (2007-2060)	-0,41	10,40	-3,22	-5,47	-1,14	-0,98
2012 Ageing Report (2010-2060)	-0,90	9,55	-5,55	-2,03	-1,28	-1,58
2015 Ageing Report (2013-2060)	-1,93	8,05	-4,96	-2,14	-2,33	-0,54
2018 Ageing Report (2016-2070)	-1,76	10,29	-4,45	-4,08	-2,82	-0,69
2021 Ageing Report (2019-2070)	-1,80	9,52	-3,53	-4,31		

Table 18.a - Breakdown of the difference between the 2018 projections and outcome figures (% of GDP)

	2016	2017	2018	2019
Ageing report 2018 (revised november, 2019)	15,62	15,55	15,55	15,77
- Change in assumptions	-0,24	-0,38	-0,35	-0,38
- Improvement in the coverage or in the modelling	0,00	0,00	0,00	0,00
- Change in the interpretation of constat policy	0,00	0,00	0,00	0,00
- Policy related changes	0,00	0,00	0,00	0,00
New projection	15,38	15,18	15,20	15,39

Source: Member State.

Table 18.b - Breakdown of the difference between the 2018 and the new public pension projection (% of GDP)

	2019	2030	2040	2050	2060	2070
Ageing report 2018 (revised november, 2019)	15,8	17,3	18,6	17,1	15,0	13,9
- Change in assumptions	-0,4	0,0	-0,7	-0,9	-0,9	-0,3
- Improvement in the coverage or in the modelling	0,0	0,0	0,0	0,0	0,0	0,0
- Change in the interpretation of constat policy	0,0	0,0	0,0	0,0	0,0	0,0
- Policy related changes	0,0	0,0	0,0	0,0	0,0	0,0
New projection	15,4	17,3	17,8	16,2	14,1	13,6

Source: Member State.

Chapter 4 - The projection model

4.1 Updating and institutional utilization

As in the past, the projections of the Italian pension system for the 2021 round of EPC-WGA forecasting exercise have been run with the model of the Department of General Accounts (Dipartimento della Ragioneria Generale dello Stato - RGS), which covers the whole public pension expenditure, according to the definition given in paragraph 3.1.

The RGS pension model has been regularly updated since 1999 (yearly up to 2011 and twice a year thereafter). Ordinary updating procedures involve the setting of data and parameters for the base year, while demographic and macroeconomic assumptions are revised depending on the availability of new estimates and information. Methodological improvements have also been introduced over time.

Projections of the Italian pension system are regularly made on the basis of two different baseline scenarios respectively based on national and EPC-WGA scenario assumptions. The latter are presented as part of Italy's Stability Programmes, in the section devoted to the analysis of the mid-long term sustainability of public finances. The projection based on the national baseline scenario is also reported in the Public Finance Documents³².

Projection results, based on both scenarios, are illustrated in the RGS annual Report which focuses on the mid-long term prospects of public expenditure for pensions, health and long term care. Any changes to the projection model and scenario assumptions are also commented in the Report as well as the updating procedure. The RGS Report also includes an in depth sensitivity analysis of demographic and macroeconomic parameters. Since 2002, a standardized set of tables has been included in the Annex of the RGS Report, which encompasses analytical results of projections in order to improve comparability through time and between different scenario assumptions.

The latest RGS Report refers to the 2020 update of projections and is based on the legislation in force in June 2020³³. In this context, the EPC-WGA baseline scenario

³² Such documents are prepared each year by the Ministry of Economy and Finance and presented to Parliament by the Government.

³³ Ministero dell'Economia e delle Finanze-RGS (2020), *Le tendenze di medio-lungo periodo del sistema pensionistico e socio-sanitario* (Mid-long term trends for the pension, health and long term care systems), Report no. 21,

already incorporates, for the mid-long term, the new set of demographic and macroeconomic assumptions defined in the EPC-WGA for the 2021 round of age-related expenditure projections³⁴. The latest projections, based on national and EPC-WGA baseline scenarios, was made in September 2020 for the Update of the Economic and Financial Document.

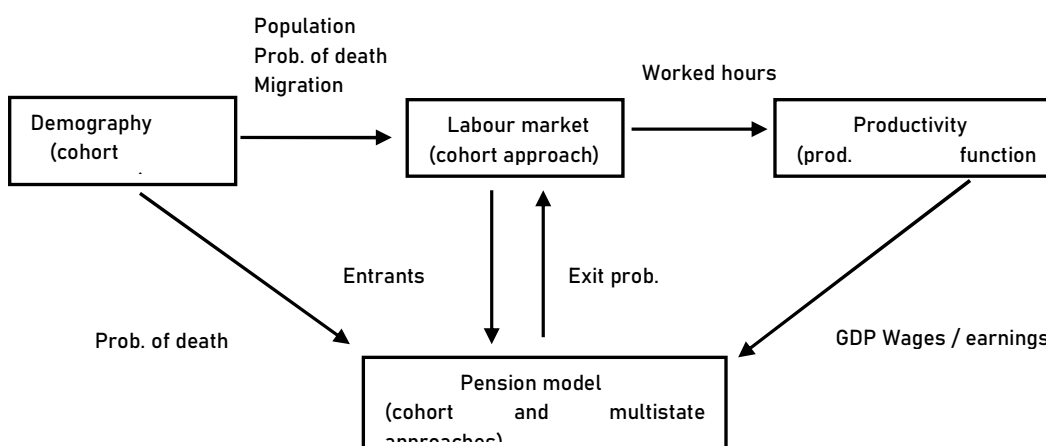
The RGS pension model has been constantly used to assess the financial effects of proposed and/or implemented pension reforms. It has also been used at national and international levels within research programmes on the financial implications of ageing and of pension reforms, as well as within institutional cooperation with the OECD and the IMF.

Compared to the previous 2018 WGA projections as revised in November 2019, the database of the insured covering the private and public sector employees and the self-employed has been updated to 2017. The legal framework is in line with the legislation in force at the end of September 2020 (§. 1.2).

4.2 Methodology

The RGS pension model is designed to reproduce accurately the main features of the legal-institutional framework, allowing to take into consideration all the several pension reforms enacted during the last two decades. At the same time, the model is provided with methodological solutions assuring consistency with demographic and macroeconomic scenario assumptions.

The pension model is composed of four modules: demography, labour market, productivity, and pension. The pension module is strictly interrelated with the others as in the outline reported below:



http://www.rgs.mef.gov.it/_Documenti/VERSIONE-I/Attivit--i/Spesa-soci/Attivita_di_previsione_RGS/2020/Rapporto-2020_11092020_Finale_pubblicato.pdf

³⁴ For the short term, generally the first three-four years, the macroeconomic assumptions are fully aligned to those underlying the Public Finance Documents.

The demographic module adopts the traditional cohort component approach according to which the number of people, by age and sex, is projected on the basis of probabilities of death, total fertility rates, and net migration flows. The last ones, in turn, are obtained as a difference between emigrants (based on the probabilities of emigrating) and immigrants³⁵.

The labour market module is mainly based on a projection of the labour force, by age, sex and level of education, to which unemployment rates are applied. The labour force projection combines the dimensional effect of working age population and the cohort evolution of participation rates. The latter is obtained extrapolating the cohort trend in the propensity to enter the labour market on a permanent basis, estimated on the labour force database. The extrapolation of past trends is adjusted to take account of further effects brought about by: i) the evolution of enrolment rates and related changes in educational attainment, and ii) the fulfilment of eligibility requirements for pension entitlement, which depends on pension legislation and worker distribution by age and contribution years.

Unemployment rates, distributed by age and sex, are assumed to change over time, converging on an average target value also taking into account the evolution of the working age population. The total hours worked are calculated on the basis of the incidence of part-time and full-time workers, and the corresponding average hours worked.

The productivity module bases its projection on a sum of two components: i) an exogenous assumption on the growth rate of total productivity factors, which is kept constant at its long term level after an initial adjustment, and ii) the additional contribution due to changes in the ratio of capital stock to employment (capital deepening). To this end, a Cobb Douglas production function is used.

The pension module adopts a multistate approach involving a large number of 'discriminating' variables, i.e. variables which are relevant for the pension rules to be applied. Such variables are divided into two groups: state and monetary variables.

The first group contains variables that identify distinct positions within the system, as reported in the table below.

State variables	Specifications
-----------------	----------------

³⁵ The national baseline scenario adopts the demographic projections elaborated by Istat (National Statistic Institute). The latest demographic projection, with 2018 as the base year, was published in October, 2019, <http://demo.istat.it>.

Fund (or group of workers)	13 in the private sector and 5 in public sector
Sex	Male, female
Age	[15-74]
Typology of contributor	Contributor, dormant, pensioner-contributor
Contribution years	[0-49] before retirement; [1-20] after retirement
Regime	Earnings-related, contribution-based, mixed
Typology of pension	Disability (2 types), old age, early retirement

At any time, it is possible to identify members of the pension system in terms of their belonging to one of the possible combinations of the state variable specifications. The forecast of members is worked out according to the following equation:

$$\underbrace{\mathbf{a}_{t,s,x,f}}_{\text{members}} = \underbrace{\mathbf{a}_{t-1,s,x-1,f}}_{\text{members}} \underbrace{j_{t-1,s,x-1,f}}_{\substack{\text{probability} \\ \text{of surviving}}} \cdot \underbrace{\mathbf{T}_{t-1,s,x-1,f}}_{\substack{\text{transition} \\ \text{matrix}}} + \underbrace{\mathbf{e}_{t,s,x,f}}_{\text{entrants}} \quad " s, f, 15 \leq x \leq W$$

where, for each sex s , age x , and fund (or specific group of workers) f , \mathbf{a} indicates the row vector of the insured distributed by different states at the end of the year t , j is the probability of surviving, \mathbf{e} indicates the row vector of entrants to the pension system in the year t , and \mathbf{T} is a matrix of transition probabilities that allows to calculate the changes in the state of members already insured at the end of the year $t-1$ and still alive at the end of the year t . The general element t_{ij} of the transition matrix expresses the probability that a member belonging to state i at the end of the year $t-1$ will transit to state j at the end of the year t .

New entrants, i.e. those insured for the first time in the pension system, are set equal to the cohort increase of employment, suitably transformed into new contributors. The number of entrants by age and sex are attributed to each fund, or other appropriate aggregations of workers, on the basis of specific distributions of probability.

Mean values of monetary variables, such as wages/earnings, pension etc., are associated with each of the possible combinations of the state variable specifications and supplemented with indexes of variability (the variation coefficient) and distribution functions³⁶.

The number of new survivors' pensions is determined by applying the probabilities of death and leaving a surviving spouse (or dependent children) to pensioners or contributors who have already qualified for retirement. In addition, a permutation matrix is applied to attribute an age to the surviving spouse on the basis of the age of

³⁶ In particular, such an approach allows to give adequate treatment to the topping up mechanism for the minimum pension under the DB and mixed regimes, the indexation of pensions by size bracket, and the eligibility requirement for retirement under the NDC regime.

the deceased. Overall, the number of new survivor's pensions are then added to the pensions of previous year which are still being paid out.

4.3 Internal consistency of the model

The consistency of the model with the legal-institutional framework is achieved by grouping the insured according to the state variables, which have been singled out above, to provide, dynamically, all information relevant to calculate the number of pensions and their amounts. Furthermore, the model is able to take on board data concerning workers already insured in the system at the beginning of the forecasting period, including dormant members who are no longer contributing but would later be able to claim a pension, on the basis of past contribution records.

The consistency of the pension module with the demographic and occupational ones is favoured by the cohort approach, which is consistently applied throughout the model. The most relevant mechanisms through which such consistency is sought may be summarized as follows:

- with regard to mortality, consistency is assured by applying the probability of death to all the insured (contributors, pensioners, etc.), i.e. those already in the system at the beginning of the forecasting period and those entering afterwards;
- as for net migration flows and employment rates below 42, consistency is guaranteed through the calculation of workers joining the pension system as new contributors, which depends on the cohort profile of participation and unemployment rates, besides the dimension of demographic cohorts;
- consistency with employment in the age classes above 42 is also assured. In fact, the probabilities of exiting from the labour market are endogenously calculated by the pension module according to current legislation and retirement behaviour;
- net migration flows from 42 to 60 are also transformed into new contributors according to the employment rates forecast in the corresponding age classes. Immigrants above 60 are considered neither contributors nor pensioners entitled to an earnings-related pension;
- wages (or labour income in the case of the self-employed) are projected to increase over time by cohort, applying the dynamics of productivity and a further increase due to career progressions³⁷. In this regard, consistency with macroeconomic assumptions is assured by targeting the career progressions to guarantee constancy through time of the ratio between the average

³⁷ The dynamic of wages is projected by cohort, consistently with the cohort evolution of labour force and contributors. In a very stylised way, for the various segments of the pension system (scheme, regime, category of workers etc.), the following algorithm is used:

$$W_{t,a,x} = W_{t-1,a-1,x-1} (1 + s_t + p_t) (1 + g_a) (1 + e_t)$$

where: t = year; a = contribution years; x = age; σ = inflation rate; p = productivity growth rate; γ = additional wage growth rate due to career progression, which is applied as long as a further year of contribution is matured, e stands for the percentage of change necessary to guarantee that the average wage grows in line with productivity.

contribution base of all workers (gross wages for the employees and gross labour income for the self-employed) and productivity.

ANNEX 1 – Regulatory framework

The annex includes:

- a summary table describing the calculation rules under the DB, mixed and NDC regimes (Table A1.1);
- a summary table describing the eligibility requirements under the DB, mixed and NDB regimes (Table A1.2 and Table A1.3);
- a summary table reporting the evolution of the minimum eligibility requirements for old-age and early pensions, by 5-year step (Table A1.4);
- the formula and assumptions for the calculation of the transformation coefficients;
- transformation coefficients in force for the two-year period 2019-2021 (Table A1.5).

Table A1.1 - Public pension system: calculation rules

	Earnings-related scheme (DB) Workers with at least 18 years of contribution at the end of 1995, limited to pensions awarded until 31 st December 2011	Mixed scheme Workers with less than 18 years of contribution at the end of 1995, and workers with at least 18 years of contribution limited to pensions awarded as of 1 st January 2012	Contribution-based scheme (NDC) New entrants into the system as of 1 st January 1996
Old age, early retirement and disability pensions ⁽¹⁾	<p>Pension (P) is calculated according to the following formula:</p> $P = 2\% (C_1 W_1 + C_2 W_2)$ <p>where: W_1 and W_2 = reference wage C_1 e C_2 = years of contribution</p> <p>a) for contribution before 1992 (C_1), W_1 is the last monthly wage for public employees and the average of the last 5 or 10 years, for private employees and the self-employed, respectively⁽²⁾.</p> <p>b) for contribution after 1992 (C_2), W_2 is the average of the last 10 years for private and public employees⁽³⁾ and 15 years for the self-employed (starting from 2002)⁽⁴⁾.</p> <p>The accrual rate for each year of contribution is 2% up to a fixed threshold of the reference wage⁽⁵⁾. Beyond this limit, such a percentage decreases to 1% in the case of W_1 and to 0.9% in the case of W_2.</p>	<p>Pension (P) is obtained as a sum of two components:</p> $P = PA + PB$ <p>The former (PA) is calculated by using the earning-related method while the latter (PB) the NDC method. In particular:</p> $PA = 2\% (C_1 W_1 + C_2 W_2)$ <p>where: W_1 and W_2 = reference wage C_1 e C_2 = years of contribution before 1995</p> <p>a) for contribution before 1992 (C_1), W_1 is last monthly wage for public employees and the average of the last 5 or 10 years, respectively, for private employees and the self-employed⁽²⁾.</p> <p>b) for contribution between 1993-1995 (C_2), W_2 is the average wage of a number of last years progressively increasing⁽⁴⁾.</p> <p>The accrual rate for each year of contribution is 2% up to a fixed threshold of the reference wage⁽⁵⁾. Beyond this limit, such a percentage decreases to 1% in the case of W_1 and to 0.9% in the case of W_2.</p> $PB = ct M$ <p>(for explanation, see the box on the right hand side).</p>	<p>Pension (P) is calculated according to the following formula:</p> $P = ct M$ <p>where: ct is the transformation coefficient and M the life-long contributions capitalized with the growth rate of nominal GDP.</p> <p>Transformation coefficients in force in the period 2010-2012 ranged from 4.42% at the age of 57 to 5.62% at age of 65 (above 65 they are set equal to that of 65).</p> <p>They are subject to a three-year revision (two-year revision as of 2021) to take account of changes in life expectancy, according to a procedure falling entirely under the administrative sphere of competence.</p> <p>As of 2013, they are extended to the age of 70⁽⁶⁾, and then further in line with the increase in the eligibility requirements linked to changes in life expectancy.</p> <p>Transformation coefficients in force in the period 2013-2015 ranged from 4.30% at the age of 57 to 5.43% at age of 65 (up to a maximum of 6.54% at age of 70). Those in force in the years 2016-2018 ranges from 4.25% at the age of 57 to 5.33% at age of 65, up to a maximum of 6.38% at age of 70. The transformation coefficients currently in force for the period 2019-2020 ranges from 4.2% for the age 57 to 5.6% for the age 67 up to 6.5% for the age 71. The transformation coefficients approved by the Decree of 1 June 2020 that will be in force for the period 2021-2022 are 4.2% for the age 57, 5.6% for the age 67 and 6.5% for the age 71.</p> <p>Under the age 57 the transformation coefficients are set equal to that of 57.</p> <p>The contribution rate is 33% for private and public employees, 20% for the self-employed in 2011, gradually increased to 24% in 2018. For atypical workers the contribution rate was 27% in 2012 and 2013, gradually increased to 33% in 2018.</p> <p>Contributions are due, and therefore accrued, up to a maximum threshold of taxable income⁽⁷⁾.</p>
Survivors' pensions ⁽⁸⁾	<p>60% of the pension calculated as above, if a survivor is a widow or widower of an employee; 60% of the deceased's pension, if a survivor is a widow or widower of a pensioner.</p> <p>Such a percentage is reduced by 25%, 40% or 50% if the survivor total income exceeds, respectively, 3, 4 or 5 times the minimum pension.</p>	<p>as before</p>	<p>as before</p>

(1) Disability pensions include the 'assegno ordinario di invalidità' and the 'pensione di inabilità'. As for the latter, extra contributions are generally accrued (up to the maximum that beneficiaries would have reached if they had continued to work).

(2) Wages involved in the calculation of the reference wage are indexed to prices.

(3) For the public employees, starting from 2008.

(4) Wages involved in the calculation of the reference wage are indexed to prices, plus 1%.

(5) This threshold is 47,332 euro in 2020.

(6) Indexation of age requirements is foreseen every three years from 2013 to 2019 and every two years from 2021. The 2013 and 2016 indexation of the eligibility requirements were adopted by a directorial decree of the Ministry of Economy and Finance of 14th December 2011 and 16th December 2014, respectively. The next update, which comes into force as of 1st January 2019, will be finalized by the end of 2017.

(7) The threshold is 103,055 euro in 2020.

(8) In the case of a surviving spouse with one or two children, the percentage of 60% is increased to 80% and 100%, respectively. Such a percentage is arranged differently when there are only surviving children.

Table A1.2 - Public pension system: eligibility requirements - DB and Mixed schemes

		Earnings-related (DB) and mixed schemes (DB and NDC) - Workers already insured at the end of 1995			
		2004 - 2007	Starting from 2008 (Law 243/2004 and Law 247/2007)	Starting from 2012 (Law 214/2011)	Transient changes 2019-2021 (Law 26/2019)
Old age retirement Statutory Retirement Age (SRA) ⁽¹⁾	Private/public sector employees and self employed	65 years for men, 60 years for women and 20 years of contribution for both genders	as before ⁽⁶⁾	In 2012, SRA is 66 for men and women in the public sector, 62 for women in the private sector. In all cases, 20 years of contributions are also required From 2012 to 2018, SRA of women in the private sector is gradually aligned to that of other workers From 2013, SRA is indexed to changes in life expectancy ⁽⁷⁾ .	as before
	Early retirement	Private sector employees Public sector employees Self employed	35 years of contribution and 57 years of age ⁽²⁾ or, alternatively, 38 years of contribution, in the period 2004 - 2005, and 39 in the period 2006 - 2007 ⁽³⁾ 40 years of contribution regardless of age or, alternatively, 35 years of contribution and 58 years of age until 30/06/2009, 60 from 1/07/2009 to 2010 and 61 in 2011 ⁽⁶⁾ . Starting from July 2009, workers are allowed to access early retirement at an age lower by 1 year with at least 36 years of contribution ^{(4) (5) (6)} . 40 years of contribution regardless of age or, alternatively, 35 years of contribution and 59 years of age until 30/06/2009, 61 from 1/07/2009 to 2010 and 62 in 2011 ⁽⁶⁾ . Starting from July 2009, workers are allowed to access early retirement at an age lower by 1 year with at least 36 years of contribution ^{(4) (5) (6)} .	Contribution requirement regardless of age: - Men: 42 years and 1 month of contributions in 2012 (plus 1 month in 2013, 2 months in 2014); - Women: 41 years and 1 month of contributions in 2012 (plus 1 month in 2013, 2 months in 2014). From 2013, contribution requirements are indexed every three years (every 2 years as of 2021) to changes in life expectancy ⁽⁷⁾ .	Two retirement channels: 1) Contribution requirement regardless of age: 2018 contributory requirements equal to 42y and 10 months for men and 41y 10 months for women (+ 3 months of shifting retirement window). Unlink of updates with life expectancy in the period 2019-2026 2) early retirement before the SRA with at least 62 years of age and 38 years of contributions for those accruing such requirements in 2019-2021. For private sector workers 3 months of shifting retirement window. For Public sector workers 6 months of shifting retirement window.
Disability pensions ⁽⁸⁾		5 years of contribution 3 of which accrued in the last five years.	as before	as before	as before
Survivors' pensions ⁽⁹⁾		15 years of contribution, or alternatively, only 5 years of contribution 3 of which accrued in the last five years.	as before	as before	as before

(1) Before 1992, the minimum retirement age was, respectively, 60 and 55 for private sector employees, and the minimum contribution period was 15 years.
(2) The age requirement was reduced to 56 for blue-collar workers in the period 2004 - 2005.
(3) A further postponement of the retirement age was envisaged through the so-called 'exit window', ranging from 3 to 11 months.
(4) For the period 2008-2015, women under DB and mixed schemes who have satisfied the requirements laid down by legislation before law 243/2004 are allowed to retire before 60 as long as they choose the less favourable pension treatment provided by the NDC method.
(5) From 2008, the further postponement through the 'exit window' was foreseen for all regimes, averaging about 9 months for the employees and 15 months for the self-employed.
(6) In 2011, for both old age and early pensions, the retirement age was postponed through the 'exit window' by 1 year for employees and 1 year and half for the self-employed.
(7) The 2013, 2016, 2019 and 2021 indexation of the eligibility requirements establishing an increase in the pension requirements of respectively of 3, 4, 5 and 0 months were adopted by a directorial decree of the Ministry of Economy and Finance of respectively 14th December 2011 and 16th December 2014 and 5th December 2017 and 5 november 2019, respectively. The Law 26/2019 has discontinued the 2019 increase of 5 months in the minimum contributory requirement for early retirement regardless of age to account for higher life expectancy and has discontinued the following increases until 2026. Hence, the next update, which come into force as of 1st January 2027, will be finalized by the end of 2026. A time window of three months has been introduced. This window is maintained throughout the forecast period.
(8) After the 1984-reform (law 222/84), the entitlement of disability pensions only depend on mental and physical impairments regardless of labour market conditions.
(9) Survivors' pensions may be also entitled to children up to 18 (or 26, in the case of students).

Table A1.3 - Public pension system: eligibility requirements - NDC scheme

		Contribution-based scheme (NDC) - New entrants into the system after 1995		
		up to 2007	Starting from 2008 (Law 243/2004 and Law 247/2007)	Starting from 2012 (Law 148/2011)
Old age retirement Statutory Retirement Age (SRA) ⁽¹⁾	Private/public sector employees and self employed		Men: 65, with at least 5 years of contribution ⁽³⁾ . Women: 60, with at least 5 years of contribution ⁽³⁾ .	In 2012, SRA is 66 for men and women in the public sector; is 62 for women in the private sector. Retirement is allowed with at least 20 years of contribution and an amount of pension not inferior to 643 euro per month in 2012 (1.5 times the old-age allowance, in 2012). Such a threshold is indexed with the five-year average of nominal GDP. From 2012 to 2018 (1 st January), SRA of women in the private sector is gradually aligned to that of other workers From 2013, SRA is indexed to changes in life expectancy ⁽⁴⁾ .
	Private sector employees	For both genders, retirement is allowed with at least 57 year of age and 5 years of contribution or, alternatively, 40 years of contribution regardless of age.	40 years of contribution regardless of age or, alternatively, 35 years of contribution and 58 years of age until 30/06/2009, 60 from 1/07/2009 to 2010 and 61 in 2011 ⁽³⁾ . Starting from July 2009, workers are allowed to access early retirement at an age lower by 1 year with at least 36 years of contribution ^{(2) (3)} .	Two retirement channels: 1) Contribution requirement regardless of age: - Men: 42 years of contributions (plus 1 month in 2012, 2 months in 2013 and 3 months in 2014); - Women: 41 years of contributions (plus 1 month in 2012, 2 months in 2013 and 3 months in 2014);
Public sector employees				
Self employed	40 years of contribution regardless of age or, alternatively, 35 years of contribution and 59 years of age until 30/06/2009, 61 from 1/07/2009 to 2010 and 62 in 2011 ⁽³⁾ . Starting from July 2009, workers are allowed to access early retirement at an age lower by 1 year with at least 36 years of contribution ^{(2) (3)} .		From 2013, contribution requirements are indexed every three years (every 2 years as of 2021) to changes in life expectancy ⁽⁴⁾ . 2) For both gender, early retirement is also allowed, up to a maximum of three years before the SRA (63 in 2012), as long as they have matured 20 years of contributions and an amount of pension not inferior to 1,200 euro per month in 2012 (2.8 times the old-age allowance, in 2012). Such a threshold is indexed with the five-year average of nominal GDP.	
Disability pensions ⁽⁵⁾	5 years of contribution 3 of which accrued in the last five years.	as before	as before	
Survivors' pensions ⁽⁵⁾	15 years of contributions, or alternatively, only 5 years of contribution 3 of which accrued in the last five years.	as before	as before	

(1) Before 1992, the minimum retirement age was, respectively, 60 and 55 for private sector employees, and the minimum contribution period was 15 years.

(2) From 2008, the further postponement through the 'exit window' was foreseen for all regimes averaging about 9 months for employees and 15 months for the self-employed.

(3) In 2011, for both old age and early pensions, the retirement age was postponed through the 'exit window' by 1 year for employees and 1 year and half for the self-employed.

(4) The 2013, 2016, 2019 and 2021 indexation of the eligibility requirements establishing an increase in the pension requirements of respectively 3, 4, 5 and 0 months were adopted by a directorial decree of the Ministry of Economy and Finance of respectively 14th December 2011 and 16th December 2014 and 5th December 2017 and 5 November 2019, respectively. The Law 26/2019 has discontinued the 2019 increase of 5 months in the minimum contributory requirement for early retirement regardless of age to account for higher life expectancy and has discontinued the following increases until 2026. Hence, the next update, which come into force as of 1st January 2027, will be finalized by the end of 2026. A time window of three months has been introduced. This window is maintained throughout the forecast period.

(5) After the 1984-reform (law 222/84), the entitlement of disability pensions only depend on mental and physical impairments regardless of labour market conditions.

TableA.1.4 - Statutory retirement age (SRA) and early retirement

Years of contributions		2016	2020	2030	2040	2050	2060	2070
Qualifying condition for old age retirement	<u>Old age retirement (SRA)⁽¹⁾</u>							
	Minimum retirement age (SRA) - men	66y+7m	67y	67y+8m	68y+6m	69y+4m	70y+2m	71y
	Minimum retirement age (SRA) - w omen ⁽²⁾	65y+7m	67y	67y+8m	68y+6m	69y+4m	70y+2m	71y
	Minimum contributory period - men	20	20	20	20	20	20	20
	Minimum contributory period - w omen	20	20	20	20	20	20	20
Qualifying condition for early retirement	<u>Early retirement regardless of age (all regimes)⁽¹⁾</u>							
	Minimum contributory requirement - men	42y+10m	42y+10m	43y+2m	44y	44y+10m	45y+8m	46y+6m
	Minimum contributory requirement - w omen	41y+10m	41y+10m	42y+2m	43y	43y+10m	44y+8m	45y+6m
	<u>Early retirement under the NDC regime⁽¹⁾</u>							
	Minimum retirement age - men			64y+8m	65y+6m	66y+4m	67y+2m	68y
	Minimum retirement age - w omen			64y+8m	65y+6m	66y+4m	67y+2m	68y
	Minimum contributory period - men			20	20	20	20	20
	Minimum contributory period - w omen			20	20	20	20	20
	Minimum amount of pension - men ⁽³⁾	1,200 euro per month in 2012 (2.8 times the old age allowance, in 2012) indexed with the five-year average of nominal GDP						
	Minimum amount of pension -w omen ⁽³⁾	1,200 euro per month in 2012 (2.8 times the old age allowance, in 2012) indexed with the five-year average of nominal GDP						

(1) The age requirements (and contribution requirements for early retirement regardless of age) are indexed to changes in life expectancy at 65. The update is foreseen every three years until 2019 and then every two years. Changes in life expectancy are consistent with the mortality assumptions underlying the Eurostat demographic projection, with the 2015 as the base year.) The 2013, 2016, 2019 and 2021 indexation of the eligibility requirements establishing an increase in the pension requirements of respectively 3, 4, 5 and 0 months were adopted by a directorial decree of the Ministry of Economy and Finance of respectively 14th December 2011 and 16th December 2014 and 5th December 2017 and 5 november 2019, respectively. The Law 26/2019 has discontinued the 2019 increase of 5 months in the minimum contributory requirement for early retirement regardless of age to account for higher life expectancy and has discontinued the following increases until 2026. Hence, the next update, which come into force as of 1st January 2027, will be finalized by the end of 2026. A time window of three months has been introduced. This window is maintained throughout the forecast period.

(2) SRA of the female employees in the private sector equalizes that of men (and w omen in the public sector) starting from 2018. In 2016, the SRA of the female self-employed is 6 months lower.

(3) The minimum amount of pension is 1,200 euro per month in 2012 (which corresponds to 2.8 times the old age allowance, in 2012) indexed with the five-year average of nominal GDP.

1.1 Transformation coefficients: formula and assumptions

The formula and parameters for the calculation of the transformation coefficients are given below:³⁸

$$TC_x = \frac{1}{D_x}$$

$$D_x = \frac{\sum_{s=m,f} (b_{x,s}^{V(t)} + A_{x,s}^{V(t)})}{2} - k$$

Average present value of direct pension awards:

$$a_{x,s}^{V(t)} = \sum_{t=0}^{W-x} \frac{l_{x+t,s}}{l_{x,s}} \left(\frac{1+r}{1+s} \right)^{-t}$$

Average present value of reversibility pension awards:

$$A_{x,s}^{V(t)} = \sum_{t=0}^{W-x} \frac{l_{x+t,s}}{l_{x,s}} q_{x+t,s} \left(\frac{1+r}{1+s} \right)^{-t} Q_{x+t,s} h d_s \sum_{t=1}^{W-x-t+e_s} \frac{l_{x+t+e_s,s}^{ved}}{l_{x+t+1-e_s,s}^{ved}} \left(\frac{1+r}{1+s} \right)^{-t}$$

Where :

TC = *transformation coefficient*

D = *divisor*

s = m, f

$\frac{l_{x+t,s}}{l_{x,s}}$ = *probability of surviving between ages x and $x+t$*

X = *retirement age*

W = *maximum age*

$q_{x+t,s}$ = *probability of death between ages $x+t$ and $x+t+1$*

$Q_{x+t,s}$ = *probability of leaving a surviving spouse at the age $x+t$*

³⁸ Ministero dell'Economia e delle Finanze-RGS (2020), *Le tendenze di medio-lungo periodo del sistema pensionistico e socio-sanitario* (Mid-long term trends for the pension, health and long term care systems), Report no. 21, Appendice 1, (http://www.rgs.mef.gov.it/_Documenti/VERSIONE-I/Attivit--i/Spesa-soci/Attivita_di_previsione_RGS/2020/Rapporto-2020_11092020_Finale_publicato.pdf). The 2021-2022 revision of the transformation coefficients was adopted by a directorial Decree of the Ministry of Labour and Social Policies of 1 June, 2020 according to an automatic, administrative procedure laid down by Law 247/2007.

$\frac{I_{x+t,s}^{ved}}{I_x^{ved}} = \text{probability for a widow or widower to be eliminated because of death or new marriage.}$

$k = \text{adjustment owing to how pension is drawn. This parameter accounts for 0.4615}$

$e_s = \text{difference between the pensioner's age of sex } s \text{ and the spouse's age}$

$h = \text{percentage of reversibility}$

$\bar{a}_s = \text{average percentage of reduction of the survivor's pension owing to income requirements.}$

$r = \text{internal return rate}$

$s = \text{indexation rate}$

$$\left(\frac{1+r}{1+s} - 1 \right) = 1.5\% = \text{discount rate}$$

Table A1.5 – Transformation coefficients in force for the two-year period 2021-2022

Age	Transformation coefficients	Annuity factor
57	23,892	4,186%
58	23,314	4,289%
59	22,734	4,399%
60	22,149	4,515%
61	21,558	4,639%
62	20,965	4,770%
63	20,366	4,910%
64	19,763	5,060%
65	19,157	5,220%
66	18,549	5,391%
67	17,938	5,575%
68	17,324	5,772%
69	16,707	5,985%
70	16,090	6,215%
71	15,465	6,466%

Source: Directorial decree of the Ministry of Economy and Finance of June 1st, 2020, published in the Official Journal (Gazzetta Ufficiale) of June 11th, 2020.

ANNEX 2 - Further information requested in the methodological annex

1. Economy-wide average wage at retirement

In the projections, the average contribution base grows in line with productivity (see §§. 3.6 and 4.3 of the fiche), so does the economy-wide average wage. The economy-wide average wage at retirement has been calculated as the product of economy-wide average wage times the ratio between the average contribution base at retirement and the average contribution base. The latter ratio actually reflects the assumption on the career age wage profile.

Table A.2.1 - Economy wide average wage at retirement (1000 EUR)

	2019	2030	2040	2050	2060	2070	% change 2019-2070
Economy-wide average wage [a]	30,6	38,1	53,1	76,7	110,3	157,2	414,2%
Economy-wide average wage at retirement [b]	33,7	45,5	63,3	87,4	128,6	175,8	421,8%

2. Pensioners vs pensions

See §. 3.4.4 and for the issue of consistency of labour force projections in national models see § 4.2 and 4.3.

3. Pension taxation

See § 1.1.7 and § 3.2

4. Disability pensions

Disability pensions are transformed into old-age pensions at the SRA. However, from a statistical point of view they continue to be labelled as "disability pensions". Therefore, the values included in the pension reporting frameworks correspond to an estimate of disability pensions below the SRA, which changes over time according to the indexation of the eligibility requirements.

Table A2.2 reports the disability rates by age group and forecasting years, which have been calculated as a ratio between disability pensions, projected by the pension model, and the corresponding population. The rates look quite stable over time. However, owing to the indexation of the eligibility requirements, a substantial increasing trend may be seen in the age classes mainly affected by changes in the retirement age.

Figure A2.1 and A2.2 illustrate, respectively, the evolution of the number of disability pensions as well as their average amount compared to that of old-age and early pensions.

Table A.2.2 - Disability rates by age groups (%)

	2019	2030	2040	2050	2060	2070
- Age group -54	0,6	0,6	0,7	0,6	0,6	0,6
- Age group 55-59	3,2	3,6	3,9	4,1	3,8	3,6
- Age group 60-64	3,6	5,1	5,7	5,7	5,1	5,4
- Age group 65-69	2,2	3,5	4,3	4,8	5,6	5,1
- Age group 70-74	0,0	0,0	0,0	0,0	0,5	1,1
- Age group 75+	0,0	0,0	0,0	0,0	0,0	0,0

Source: Member State.

Figure A2.1: number of disability pensions below SRA (thousand)

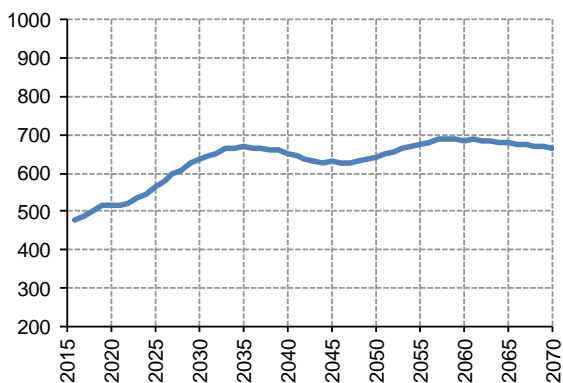
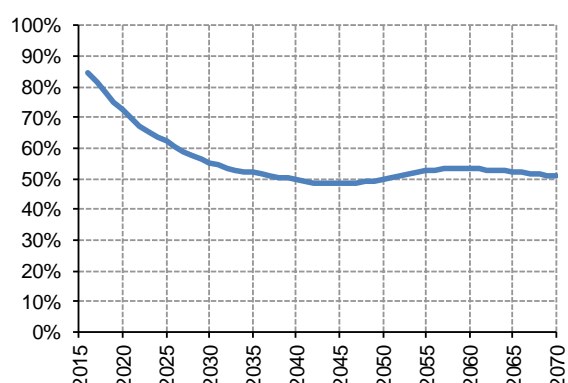


Figure A2.2: average disability pension to average old age and early pension



5. Survivor pensions

The dynamics of survivor pensions, and their average amount, reflect the evolution of old-age and early pensions with an average delay of 10-15 years and are positively correlated with the gap in life expectancy between males and females. They also depend on the probabilities of leaving a spouse/children who have the right to claim a survivor's pension and the age gap between the deceased pensioner and their spouse. The mortality rates used in the model are taken from the demographic assumptions, while the other parameters mentioned above are consistent with those employed for the estimate of the transformation coefficients currently in force.

Figure A2.3 e A2.4 illustrate, respectively, the evolution of the number of survivor's pensions as well as their average amount compared to that of old-age and early pensions.

Figure A2.3: number of survivor pensions (thousand)

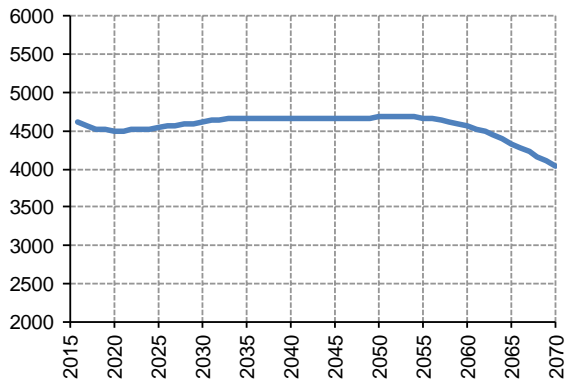
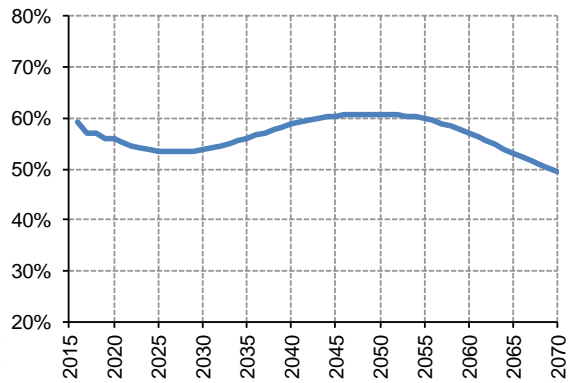


Figure A2.4: average survivor pension to average old age and early pension



6. Contributions

See §. 3.6

7. Alternative pension spending disaggregation

The Table A2.3 is similar in structure to Table 8 but provides a disaggregation based on pension data rather than pensioners.

Table A.2.3 - Factors behind the change in public pension expenditure between 2019 and 2070 (percentage points of GDP) – pensions

	2019-30	2030-40	2040-50	2050-60	2060-70	2019-70
Public pensions to GDP	1,9	0,5	-1,6	-2,1	-0,6	-1,8
Dependency ratio effect	3,7	4,6	1,5	-0,2	0,0	9,5
Coverage ratio effect⁽¹⁾	-1,6	-1,2	-0,1	-0,2	-0,5	-3,7
Coverage ratio old-age	-1,0	-0,5	0,1	-0,2	-0,5	-2,2
Coverage ratio early-age	-4,0	-4,3	-3,6	-1,7	-1,2	-14,8
Cohort effect	-2,1	-5,5	-1,5	1,0	-0,2	-8,4
Benefit ratio effect	1,3	-1,7	-2,6	-1,4	0,3	-4,1
Labour market effect	-1,3	-0,8	-0,3	-0,2	-0,3	-2,9
Employment ratio effect	-0,7	-0,5	-0,3	0,0	-0,1	-1,6
Labour intensity effect	0,0	0,0	0,0	0,0	0,0	0,0
Career shift effect	-0,6	-0,4	0,0	-0,2	-0,2	-1,4
Residual	-0,2	-0,3	-0,1	0,0	0,0	-0,6

(1) Subcomponents of the coverage ratio effect do not add up necessarily.

8. Administrative data on new pensions

Table A.2.4 - administrative data on new pensions⁽¹⁾ (2019)

Table A4.a - men

Age group	All	Old-age	Disability	Survivor	Other (including minimum)
15 - 49	10.222	8	7.500	2.714	
50 - 54	9.657	1.074	7.338	1.245	
55 - 59	46.046	33.907	10.477	1.662	
60 - 64	153.291	143.189	7.867	2.235	
65 - 69	91.056	86.312	1.512	3.232	
70 - 74	7.085	2.224	27	4.834	
75+	27.219	284	9	26.926	

Table A4.b - women

Age group	All	Old-age	Disability	Survivor	Other (including minimum)
15 - 49	12.244	1	5.374	6.869	
50 - 54	9.140	48	3.936	5.156	
55 - 59	36.219	22.586	5.152	8.481	
60 - 64	87.215	70.472	4.135	12.608	
65 - 69	74.359	54.682	970	18.707	
70 - 74	30.770	2.452	40	28.278	
75+	95.059	279	6	94.774	

Table A4.c - total

Age group	All	Old-age	Disability	Survivor	Other (including minimum)
15 - 49	22.466	9	12.874	9.583	
50 - 54	18.797	1.122	11.274	6.401	
55 - 59	82.265	56.493	15.629	10.143	
60 - 64	240.506	213.661	12.002	14.843	
65 - 69	165.415	140.994	2.482	21.939	
70 - 74	37.855	4.676	67	33.112	
75+	122.278	563	15	121.700	

(1) This sheet presents the number of new pensions and not on pensioners as required by the WGA questionnaire. In the Italian framework, pensioners could add more than one pension. This may happen especially in the case of survivor pensions.

9. Private component of the Italian pension system

Table A.2.5 - Private component of the Italian pension system - Time series 2000-2019

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Pension expenditure, gross (mln €)	1,568	2,120	1,847	2,788	1,887	1,502	2,484	1,715	2,336	1,697	1,731	1,695	1,608	1,565	1,328	1,519	1,765	1,512	2,106	1,275	
Non-mandatory occupational pensions ⁽¹⁾⁽²⁾	1,568	2,120	1,847	2,788	1,887	1,502	2,484	1,715	2,336	1,697	1,731	1,695	1,608	1,565	1,328	1,519	1,765	1,512	2,106	1,275	
- pensions	602	637	733	736	735	698	918	905	900	892	890	878	897	889	886	886	748	724	705	639	639
- benefit in capital	966	1,483	1,114	2,052	1,152	804	1,566	810	1,436	805	841	817	711	676	442	663	1,017	788	1,402	635	635
Non-mandatory private pensions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of pensioners (thousands)	108	121	123	114	111	111	143	133	133	132	130	131	130	130	133	130	118	119	116	115	115
Non-mandatory occupational pensions ⁽¹⁾⁽²⁾	108	121	123	114	111	111	143	133	133	132	130	131	130	130	133	130	118	119	116	115	115
Non-mandatory private pensions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Contributions (mln)	2,665	3,751	4,231	4,568	4,951	5,481	6,231	8,434	10,900	11,121	11,481	11,842	12,052	12,414	13,008	13,547	14,256	14,544	16,000	15,918	15,918
Non-mandatory occupational pensions ⁽¹⁾	2,665	3,395	3,638	3,822	4,021	4,401	4,988	7,007	9,118	9,146	9,212	9,365	9,316	9,306	9,631	9,778	10,162	10,478	11,724	11,430	11,430
Non-mandatory private pensions	0	356	593	746	930	1,080	1,243	1,427	1,782	1,975	2,269	2,477	2,736	3,108	3,377	3,769	4,094	4,058	4,268	4,480	4,480
Number of contributors (thousands)	1,692	2,160	2,396	2,587	2,740	2,963	3,184	4,560	4,854	5,055	5,273	5,537	5,829	6,204	6,540	7,227	7,787	8,299	8,740	9,117	9,117
Non-mandatory occupational pensions ⁽¹⁾	1,692	1,959	2,038	2,078	2,112	2,219	2,304	3,424	3,536	3,570	3,569	3,577	3,580	3,627	3,687	4,251	4,547	4,822	5,115	5,362	5,362
Non-mandatory private pensions	0	201	357	509	628	744	880	1,136	1,314	1,485	1,703	1,960	2,249	2,577	2,853	2,976	3,240	3,477	3,626	3,755	3,755
Assets of pension funds and reserves (mln €)	23,011	32,970	34,642	37,609	40,878	47,307	51,576	57,747	61,302	73,827	83,167	90,687	104,363	116,485	130,941	140,351	151,278	162,299	167,145	185,121	185,121
Non-mandatory occupational pensions ⁽¹⁾	23,011	32,777	34,025	36,331	38,728	43,969	47,030	51,957	54,677	64,861	71,958	77,495	88,277	96,952	107,722	113,345	120,636	127,597	129,733	142,483	142,483
Non-mandatory private pensions	0	193	617	1,278	2,150	3,338	4,546	5,790	6,625	8,966	11,209	13,192	16,086	19,513	23,219	27,006	30,642	34,702	37,412	42,628	42,628

Source: Covip (2000-2019). Relazione annuale. Such reports can be downloaded from the following web site: www.covip.it

(1) It includes open and close pension funds and those pre-existing before 1993-reform.

(2) It only refers to the "pre-existing" pension.